

American Aviation

MANAGEMENT
ENGINEERING
PRODUCTION
OPERATIONS
MAINTENANCE
EQUIPMENT



AUGUST 30
1954

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On Europe 20**



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Procurement Rules . 34**



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Military interest in small jet engines continues to mushroom. Competitions and contracts, while led by helicopter requirements, are much more broad with engines in the range of 1000 to 2500 pounds thrust most active.

General Electric and Fairchild are strongest competitors for this new business. Pratt & Whitney, Allison, and Curtiss-Wright continue to put virtually all emphasis on increasingly higher powers.

Long-standing interest of airframe manufacturers in jet engine of about 5000 pounds thrust, built to present-day standards of efficiency, remains unsatisfied. Scale effect works to detriment of high efficiencies in such applications.

West Coast aircraft companies are preparing for this year's demands by AFL-Machinists and CIO-Autoworkers as contracts near expiration dates. But signs are that there will be no walkouts, at least until after the November political elections.

Both unions are convinced the present Administration in Washington is less inclined to favor labor than the Truman Administration. If Republicans lose ground in either the House or Senate, or both, UAW's Walter Reuther and IAM's Al Hayes may decide to take on one of the major plane companies in a strike.

Air Force, which regained world altitude record recently, reportedly in a Bell X-1-A, is likely to lose helicopter altitude and speed records at Dayton Air Show in September.

Flying a Sikorsky S-59, an Army pilot is scheduled to make an attempt on the record set by a USAF Piasecki H-21 last September: 22,110 feet and 146.735 mph. If successful, attempt will shift record from piston-powered H-21A to turbine-powered XH-39 which uses a Turbomeca Artouste II, now being built by Continental as the T-51.

Two important oversights in the newly passed \$22 million reactivated federal aid-airport program: (1) While accepting recommendation to exclude terminal buildings, Commerce has so far ignored the corollary calling for federal agencies to pay for space used at going rates: (2) Newly established standards ignore study group recommendations that non-revenue buildings be eligible for federal aid, thus making control towers ineligible.

Both airport officials and the Air Transport Association are expected to campaign to correct these oversights.

Buoyed by new-found Congressional support, larger local service lines can be expected to ask CAB for immediate permanent certificates. CAB has authority to issue permanent licenses but has not authorized a local line for over seven years.

Although permanent bill did not get Senate approval this session, strong showing of the bill assures its revival next January when Congress comes back. Thus, CAB, which opposed this year's bill, is expected to consider beating Congress to the gun by giving serious thought to permanent applications.

North Central and Mohawk are earliest to push their cases. Senator Bricker says he expects a "half-dozen" of large lines to get permanent licenses from CAB.



The Washington View

Locals' Good Fight Is Rewarded

The local service airlines have made perhaps the most phenomenal political recovery in the shortest time of any segment in the U. S. business world.

They have, in effect, superimposed the will of the people over that of the Administration to assure their survival for many years to come—if not permanently.

Faced with extinction by the Administration-backed ACC air policy report this spring, the local industry is now very much alive and the teeth of that ACC report have been ground down to virtually harmless proportions.

Behind this rapid about-face is the strongest Congressional support any segment of the airline industry has been able to muster in years.

When the Administration-minded CAB majority said it was going to implement provisions of the ACC study, which could have meant an early end to the local service experiment, Congress responded with bills in both the House and Senate to make the 14 small lines permanent fixtures on the U. S. airline map.

Though not taken too seriously in the beginning (the legislative process is normally slow) the House bill, H.R. 8898, introduced by Rep. Hinshaw (R.-Calif.), went through in a walk. Significantly, it was passed over the opposition of the Murrays' and Weeks' of Commerce and the unanimous five-man CAB.

For a political revival, this could have been enough for the local lines, but with former CAB chairman Donald W. Nyrop leading the way, they made a fight of it in the Senate right up to the last week of the session. Only a logjam of legislative matter prevented its passage there.

But the point was made. The local lines serve the small towns throughout the country and the pride of each of those towns in their own air service was more than adequately reflected in the views of their individual Congressmen.

It boils down further to this. No Congressman is going to vote against a bill that would mean permanency for the carrier serving his area. To do so would be akin to political suicide.

But another and far-reaching point was made. Whereas CAB was gradually but surely slipping into a position governed by the Administration, it has been realerted to the fact that it is an arm of Congress, created by Congress, and destined by the policies set by Congress.

So, unless the law is changed radically, a local carrier here or there might run into trouble over subsidies, but, as a unit, the local industry has, on the basis of its recent show of strength, insured its status for many years to come.

Eisenhower Wants Another Look

Just how familiar President Eisenhower was with the ACC policy report when he "endorsed" it earlier this year is now open to speculation.

This became apparent at a recent news conference when the President was asked: Do you believe that the policy will allow competition to be stifled and monopoly to be in force?

He replied that he didn't believe in monopoly and, if that was permissible or encouraged by the air policy report, he would want to take another look at it and decide what to do.

No Recess in Aviation Study

During the Congressional recess, the Senate Commerce Committee will remain a forum for active aviation matters. Committee Chairman Bricker has promised to issue a staff study on aviation generally which will reflect extensive hearings conducted by the Committee this year on Senator McCarran's proposed re-write of the Civil Aeronautics Act.

Bricker maintains the Act is still basically sound—but there are some "wide gaps" that must be filled. The staff study, together with a substitute bill, will be submitted to Congress next year to fill the "gaps."

Meanwhile, Democratic Senator Smathers (Fla.) has been named by Bricker to tour South America and look into aviation problems in that area. Trip will take 3-4 weeks and a report should be available in late fall.

... WILLIAM V. HENZEY



Photo—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

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Correspondents in Major Cities Around the World

August 30, 1954

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OTHER PUBLICATIONS

American Aviation Daily, a daily news service for the entire industry. \$200 per year. Managing Editor: Keith Saunders.

American Aviation Directory: twice yearly listing of products, people and organizations. \$7.50 each. Managing Editor: Marion E. Grambow.

Official Airline Guide: Monthly publication of airline schedules and fares. \$13.50 per year in USA; \$14.00 in Canada; \$15 elsewhere. Published from 139 N. Clark St., Chicago 2, Ill. Central 6-5804. Managing Editor: Robert Parrish.

Air Traffic News (Incorporating Air Tariff Reports): Daily rates and tariff news. \$175 per year. Managing Editor: Wallace I. Longstreth.

Airports, weekly newsletter for airport officials, suppliers, and services. Airmailed every Friday. \$25 per year. Managing Editor, Lois C. Philmus.

Air Information Division: 595 Broad Avenue, Ridgewood, N. Y. Phone: Morningside 6-8850. Edward H. Henkler, director.

When & Where

Aug. 30-31—ATA ground equipment subcommittee mtg., Drake Hotel, Chicago.

Aug. 31—ATA advertising subcommittee mtg., Blackstone Hotel, Chicago.

Aug. 31-Sept. 2—Scintilla Div., Bendix Aviation Corp. ignition conference at Sidney, N. Y. plant.

Aug. 31-Sept. 2—ATA agency committee mtg., Ambassador Hotel, Los Angeles.

Sept. 4-6—National Aircraft Show, Dayton, O.

Sept. 13-24—Instrument Society of America, First Int'l Instrument Congress & Exposition, and 9th Nat'l Instrument Conference & Exhibit, Philadelphia.

Sept. 17-18—Institute of Radio Engineers conference on communications, Cedar Rapids, Ia.

Sept. 21-23—ATA meteorological committee mtg., Tumbling River Ranch, Denver.

Sept. 22-24—American Rocket Society mtg., El Paso-White Sands Proving Grounds, N. M.

Sept. 22-25—Nat'l Assn. of State Aviation Officials, annual mtg., New Washington Hotel, Seattle.

Sept. 30-Oct. 1—Radio Technical Commission for Aeronautics fall assembly, Washington, D. C.

Oct. 5-7—Champion Spark Plug Co. 10th annual spark plug and ignition conference, Hotel Secor, Toledo, O.

Oct. 5-8—SAE aeronautic mtg. and display, Hotel Statler, Los Angeles.

Oct. 11-15—American Institute of Electrical Engineers fall mtg., Morrison Hotel, Chicago.

Oct. 12-13—ATA annual engineering and maintenance conference, San Francisco.

Oct. 18-22—National Safety Council, mtg. of aeronautical section, Conrad Hilton Hotel, Chicago.

Oct. 27-29—National Business Aircraft Assn. mtg., Hotel Adolphus, Dallas, Tex.

Nov. 8-10—National Aviation Trades Assn. annual convention, Biltmore Terrace Hotel, Miami Beach, Fla.

Nov. 9-12—Air Line Pilots Assn. convention, Chicago.

Nov. 14-17—Aviation Distributors and Manufacturers Assn., 12th annual mtg., Mayflower Hotel, Washington, D. C.

Nov. 17-19—Calif. Assn. of Airport Executives mtg., San Jose, Calif.

INTERNATIONAL

Sept. 7-12—Society of British Aircraft Constructors, Aircraft Show & Flying Display, Farnborough, England.

Sept. 13-17—IATA, 10th annual mtg., Paris.

Sept. 19-21—Int'l Northwest Aviation Council 18th annual convention, Hotel Vancouver, Vancouver, British Columbia.

Sept. 20-23—Federation Aeronautique Internationale general meeting, Istanbul, Turkey.

Sept. 28—IATA traffic conferences, Venice, Italy.

Oct. 5—ICAO, air navigation mtg. for the North Atlantic region, Montreal.

Oct. 14-15—Joint mtg. of Canadian Aeronautical Institute and the Institute of the Aeronautical Sciences, Montreal.

AMERICAN AVIATION

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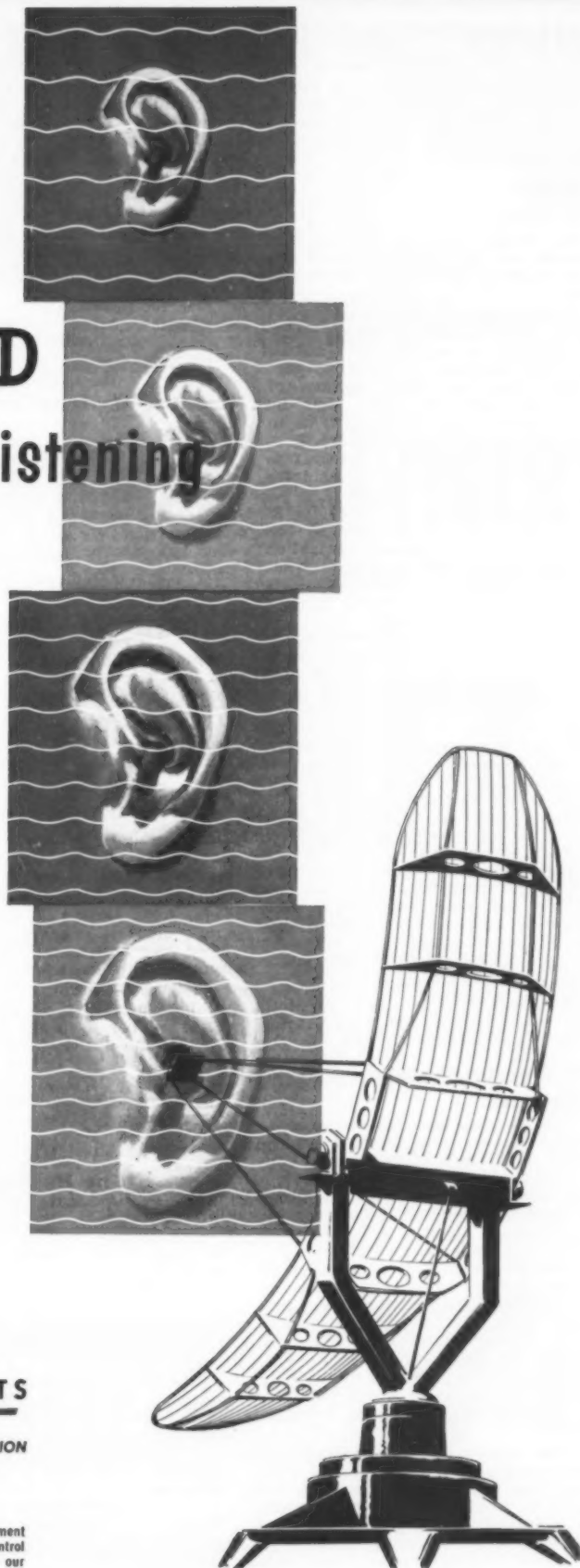
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Letters

Letters should be addressed to The Editor, AMERICAN AVIATION Magazine, 1025 Vermont Ave., N. W., Washington 5, D. C. Anonymous letters will not be printed, but names will be withheld upon request.

Backfire

To the Editor:

The August 2nd issue contains one argument and one omission which are apt to backfire upon the aviation industry.

The editorial "Railroads Cost Plenty" sidesteps the railroads' position on transport subsidies to register the position that "The railroads continue to cost commerce and the public millions of dollars in hours lost every year by blocking streets and highways." As an occasional airline passenger, am I to assume that the carrier is costing me good hard cash during the accumulated hours I've waited for baggage? Is the railroad whose trains are held up at drawbridges by ocean steamers to feel that it has a case against navigation that can be measured in dollars? What about the motorists behind the big truck on the long hill? Are all of these "costs" to be "charged up"?

The omission is on page 30 in which the report on the Standiford Field situation at Louisville, Ky., fails to note that Louisville & Nashville has plans for the enlargement and complete modernization of its Strawberry Yard. This new yard facility would occupy the very land which the Air Board is now seeking to condemn. Mind you, this is no quickie plan. L&N has been actively considering this project since the war and now the growing commerce of Louisville demands it.

The railroad's motive in the case rests largely upon this yard and not upon the passenger trains which it is seeking to withdraw from service because of lack of profit.

DAVID P. MORGAN, Editor
Trains & Travel Magazine
Milwaukee, Wisconsin

We quite readily add road-hogging trucks to the public's bill.—Ed.

The Human Nature

To the Editor:

I work for the Air Registration Board in London and always await the arrival on my desk of the current copy of AMERICAN AVIATION with great interest. The first article I read is always your own "En Route" and I want to tell you how much pleasure it has given me in the past, culminating in your July 5th issue with the story of the "Lucrecia Baccio del Fede" painting. Your description of the way in which you were presented with a copy of this painting which you obviously love so much touched me beyond words and it has given me great pleasure to think of the kindness and sincerity which went into the preparation of such a wonderful present.

The general level of articles in AMERICAN AVIATION seems superior to me than other equivalent journals, but the one feature which really distinguishes the magazine is the intensely human nature of your own contribution.

Earlier this year when I was nego-

tiating for a job in the United States (which subsequently fell through I am sorry to say) I had it in mind that if I did come to the States I would seek the opportunity of meeting you and telling you personally how much pleasure I derive from your magazine; now however this will have to suffice.

Many thanks to you and your colleagues, Mr. Parrish.

J. TEMPLETON

Westview
3, Chapel Road
Warlingham, Surrey
England

Greater Hydraulics

To the Editor:

Greater Hydraulics yet!

Thanks for the mention of our move to New York International Airport in the August 16 issue of AMERICAN AVIATION. We got a chuckle out of your typo and/or suggestion for a new corporate name.

Yours for bigger and greater hydraulics.

PAUL V. HIGGINS
Public Relations Manager
Greer Hydraulics, Inc.
454 Eighteenth Street
Brooklyn 15, N. Y.

We're sorry, of course, that "Greer" became "Greater" in print, but we're with you for greater hydraulics.—Ed.

"Gallego"

To the Editor:

I got a big kick out of your recent En Route story on the northwest provinces of Spain. Since both my parents come from Galicia, I consider myself pretty much of a "gallego." I greatly enjoyed your description of that beautiful countryside which I have not seen since I was five years old.

If, however, I do get over there, I'll remember to bring along my own gasoline and also a cow catcher to clear the roads.

LOUIS J. GARCIA
Public Relations Director
Pan American-Grace Airways
New York, N. Y.

Army Plane Procurement

To the Editor:

Your story "Should The Army Buy Its Own Planes" brings out very well some of the red tape the present system makes necessary. I think perhaps Col. Bunker is correct in his recommendation that contract administration be taken over some time in advance of complete procurement.

A little more exposure of the tremendous duplication which has been brought about by the so-called unification should not only save the taxpayers money but greatly simplify doing business on the part of aircraft manufacturers.

LAWRENCE E. WILLIAMS
Washington Representative
Piasecki Helicopter Corp.
Morton, Pa.

Books

Human Engineering Guide for Equipment Designers, by Wesley E. Woodson. Published by University of California Press, Berkeley 4, California. 260 pages, illustrated. Price \$3.50.

This is a very useful book. It is a well prepared technical presentation which compiles in one inexpensive volume much of the basic information on man's physical and biological make-up which influence his ability to complete a given task—to hear, see, reach, or generally perform the functions which are expected of him in aircraft operation.

In approaching these inherently complex matters, author Woodson does so in a fashion which makes it possible for the design engineer to grasp the essential information without loading himself down with extraneous information. The drawings, graphs, and general illustrations are particularly helpful in this light.

The book is divided into five major chapters which give the key to its scope: design of equipment and workspace, vision, audition, body measurement, and other factors. This is supplemented by a 16-page bibliography and a single-page suggested reference library. The book has a short but effective subject index.

One shortcoming: The book is paperbound and printed by photo offset. The quality of reproduction is good but the inexpensive binding is unlikely to stand up under the type usage this book is likely to get.

... WDP

V-2. By Walter Dornberger. Published by The Viking Press, 18 East 48th Street, New York 17, N. Y. \$5.

Here's the inside story of how Germany's V-2 ground-to-ground rocket was developed and how personal jealousies, battles for priorities, civilian greed, and bitter political rivalry hampered the project. Dornberger headed up the rocket research station at Peenemunde and had personal dealings with Hitler, Himmler, and Goering. The book is thus a first-hand account of how the Nazi state at times helped but usually hindered those engaged in research. It also recounts how the RAF bombing of Peenemunde slowed down the rocket program. Perhaps most interesting of all



The GRUMMAN F9F-9 "TIGER"

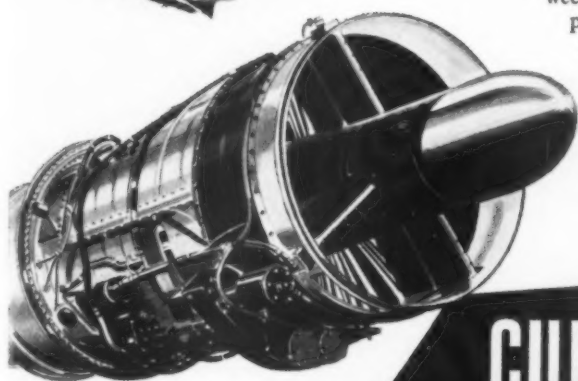
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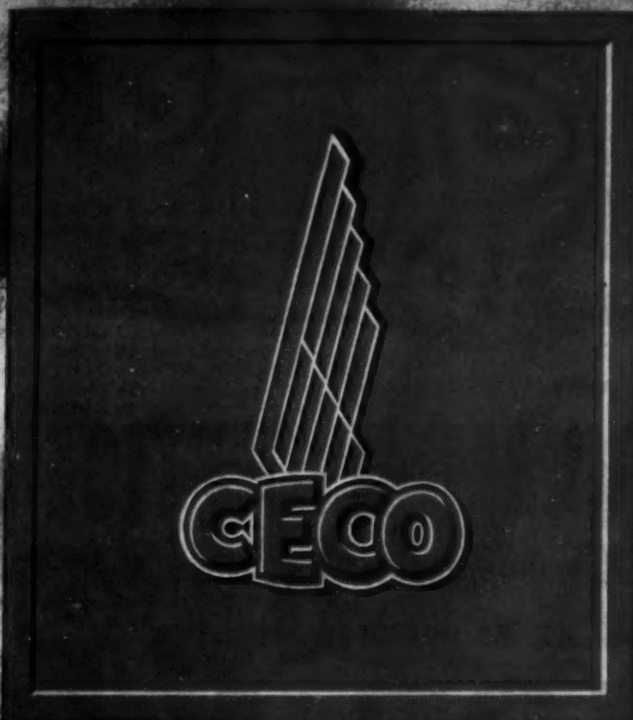
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is the description of how the rockets went into production and the manner in which they were used. The book has an introduction by rocket expert Willy Ley and contains numerous illustrations.

. . . AV

The Next Fifty Years of Flight

as visualized by Bernt Balchen and told to Erik Bergaust; published by Harper & Brothers, New York, 214 pages. Price: \$3.00.

This book, written in question-answer form, presents the interesting and enlightening projected thinking of Col. Bernt Balchen (USAF), noted Norwegian flier and Arctic explorer. He expounds to author Bergaust, Washington aviation and technical correspondent for Aftenposten, Norway's largest newspaper, on what will be in store for aviation during the next half century.

Discussed are jet aircraft, helicopters, convertiplanes, rocket flight, commercial Arctic flights, seaplanes, and space flight. The book contains numerous wash drawings by Balchen, whose hobby is art, and line drawings by Bergaust, in addition to photographic illustrations. Foreword is by Lt. Gen. James H. Doolittle. (See *Military Commentary*, page 28)

. . . HSB

The Airport Visitor. Edited by Squadron Leader N. J. Freeman and G. D. H. Linton. Published by Penman Enterprises Ltd., 202 Cheam Common Road, Worcester Park, Surrey, England. 35¢

This is the fifth edition of an annual specially designed for visitors to British airports but also of considerable value to students of commercial aviation everywhere. There are reference sections dealing with airports in the U. K., commercial aircraft types, and airlines serving British airports, together with a comprehensive article on airport operation and various other features. Perhaps most interesting of the latter is a list of over 800 airliner registration markings and other details enabling the reader to identify any commercial transports they may see at British airports (from AP-AFQ, Pakistan International Super Constellation, to 4X-ALF, EI A1 C46).

. . . AV

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Here a Sperry Field Engineer checks with an Air Force Observer on the operation of the Sperry K Bombing Navigation System.

Whirligigs for Cities

A potentially big and important market for helicopters is cities, counties, and other local political subdivisions.

Civil Defense Administrator Val Peterson placed the helicopter near the top of the list in community requirements when he spoke at the annual dinner of the American Helicopter Society in Washington several months ago.

For civil defense needs there can be no argument whatever—the helicopter is absolutely essential.

But the helicopter is not something that has to be stored away until an emergency arises. It can be used constantly for a wide variety of civil uses in the meantime. Such uses are limited only by the imagination. Zoning, highway planning, utility surveys, police work, and all manner of similar activities can be greatly aided by this versatile machine. Even small cities need at least one.

It seems to us that the helicopter manufacturers have an opportunity for sales far beyond the limitations which have beset the conventional airplane. With the active support of the Civil Defense Administration, the outlook should be brighter than ever.

Assist to Boeing

The Air Force has very wisely placed an order for the Boeing 717 Stratotanker. Thus Boeing is placed in an excellent position to move into the commercial market with its jet 707 at a lower sales price tag than would have been possible if the commercial product had to bear all of the development and tooling costs.

It must not be overlooked that the Boeing 707, as well as any other forthcoming U. S. jet transport, is an instrument of national policy. If the U. S. is to hold its own in the world market it must compete with British products which have a wide measure of government and diplomatic support. By fulfilling its own needs for jet tankers, the Air Force is giving prime aid to commercial development with all of its corollary international implications.

Tribute to Senator Pat

At the beginning of this year Senator Pat McCarran, the Nevada Democrat, introduced a bill calling for a complete revision of the Civil Aeronautics Act of 1938 which he co-authored. The overhauling job was so extensive that there was little chance of formal action on the bill at this

past session even though the Senate Interstate and Foreign Commerce Committee labored for many weeks taking testimony.

Just before Congress adjourned Senator McCarran received a rare tribute. Senator John W. Bricker, chairman of the committee, rose on the Senate floor to say that he had been directed by his committee to advise the Senate of the valuable assistance rendered to the committee by a Senator who was not a member of it, namely Senator McCarran. This action was, Senator Bricker said, "without precedent" in his experience in the upper chamber.

Few in aviation have fully appreciated the enormous amount of time spent on its behalf by Senator McCarran, and the tribute by his Ohio colleague was appropriate and well-deserved. Without much doubt, the omnibus overhaul bill will be introduced at the new session next year. It is time that all aviation organizations lend their support to obtain formal action on the overhaul bill next year. Much needs to be done. Meantime the thanks again go to Senator McCarran for his tireless efforts on behalf of civil aviation.

New Route Awards

Beginning this fall the five members of the Civil Aeronautics Board will be faced with some of the most important decisions in the history of this regulatory agency.

There are six new area route cases in various stages of proceeding. Each one is complex. Each one involves many route applications by many carriers.

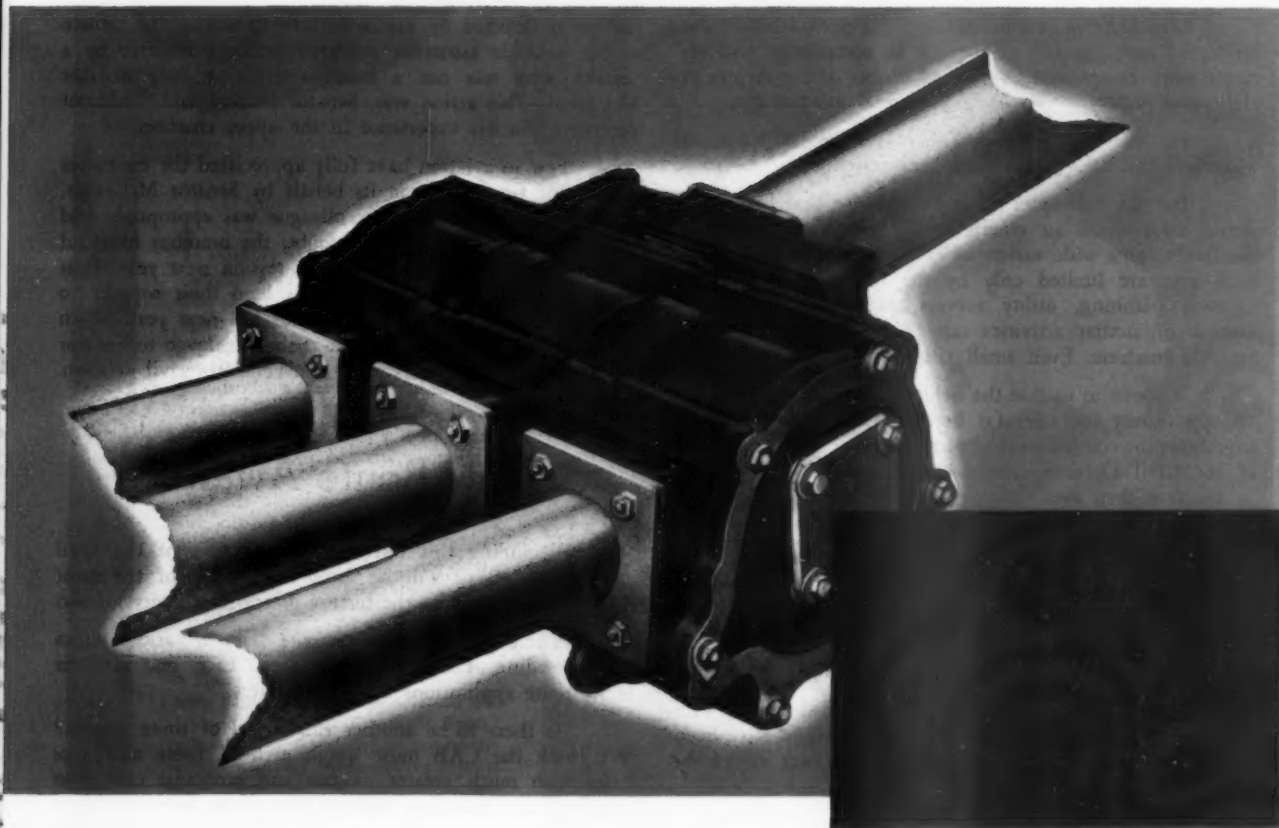
Is there to be another full round of route awards? We think the CAB must weigh each of these new area cases with much greater judicial and economic care than anything that has gone before. We are as sure that there is room for some additional service as we are sure that some areas are already at the saturation point. But the airline network as it exists today is too complete for a helter-skelter series of route awards which would give something to everybody.

The latest area case to be set for proceeding is Boston-Miami along the Atlantic seaboard. Then there is the New York-Chicago service case, the Denver service case, the Additional Northeast-Southwest case, the Norfolk-Atlanta case, and the New York-Louisville Nonstop case.

We would certainly not endeavor to assess the merits of a single portion of any or all of these cases. But we do think the CAB should approach each one with caution and take a long look before awarding new services. The quickest way to achieve another economic crisis is to dilute the present network with too much competition. Let's have new routes wherever they can be justified, but let's tighten up the justification standards.

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Industry Spotlight

• At least 30 Allison J33-A-35 engines have operated in excess of 1000 hours with 13 of these still in service. Three of these engines have operated over 1200 hours.

• Convair now has enough military orders to keep its Model 340 line going well into 1955. In addition to a USAF order for a new version, the C-131D, involving 33 planes and \$20 million, the San Diego company has sold a cargo version of the 340 to the Navy as the R4Y-1. The R4Y will feature a 200-pound-per-square-foot floor loading vs. 75 in the commercial model. There is some interest by domestic airlines in the beefed up 340 for cargo service.

• The swept Supermarine 525, successor to the straight-wing 508, is the second step in the evolution of a new carrier-based interceptor for the Royal Navy. Final type should have sufficient thrust for near zero take-off and possibly level Mach 1. Close-set engines will permit single-engine endurance cruise.

• So-called "Texas Towers," off-shore radar warning stations, are likely to reduce the total number of radar picket planes scheduled for early warning defense activity. USAF has discovered that these tower-mounted radar units, constructed 100 miles off the east coast, will give very good coverage and an early alert. Also used for weather data collection and reporting stations, the "Texas Towers" would be equipped for helicopter landings.

• Cessna Aircraft Company is scheduled to discontinue production on the Model 190 and 195 series in the near future following production of 14 now on the line. At mid-year Cessna had delivered 1059 of this series planes. It will continue to furnish and manufacture spare parts.

• First flight of the modified North American TF-86F has been made with test pilot Ray Morris at the controls. NAA's effort at invading jet trainer market now held by Lockheed's T33 was interrupted when the original prototype of the TF-86F was lost earlier this year. Company is also working on a TF-100, first jet trainer in the supersonic speed range in level flight.

• Engineers visiting Boeing as part of the plant tour arranged by The Institute of the Aeronautical Sciences noted five production B-52A's on the flight line plus the original two prototypes.

• Office of Defense mobilization has rounded out its goals on titanium. To augment its earlier programs of 25,000 tons of titanium sponge production and 37,500 tons of titanium ingot melting capacity by the end of 1956, ODM has set a new goal of 37,500 tons of titanium ingot processing capacity. U. S. now has no processing facilities for production of titanium mill products and plants designed for stainless steel output have been doing the job.

• Convair's R3Y program is picking up speed. Five planes are now flying and one is scheduled for an early cross country flight to Patuxent Naval Air Station for a 30-day, 60-hour-flight test and evaluation. Plane may make the San Diego/Patuxent flight non-stop. One recent R3Y flight test lasted more than eight hours.

• Pan American-Grace Airways is installing Bendix Aviation Corp.'s X-band RDR-1 airborne radar in five Douglas DC-7's for use on its South American routes next year. Installation follows earlier flight evaluation of the 3.2 centimeter radar in a Panagra DC-6B flying between Miami and Buenos Aires. Unit will detect storms 150 miles away.

• Wright Air Development Center at Dayton, O. is working on development of larger sized runway barriers similar to the one just ordered from Acme Aluminum Co. of Dayton for installation at 23 Air Force bases in the U. S. and 30 in Europe. Acme's unit is like those used in Korea but will be remotely controlled from the tower rather than manually controlled.

• Capital Airlines has decided to set up an overhaul shop for the Rolls-Royce Dart turboprop engines immediately. Initially it was felt that engines for the original three aircraft would be overhauled by Rolls-Royce of Canada.

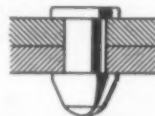
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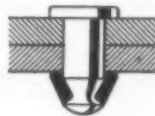
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B. F. Goodrich device lets a man get in where air cannot

1 ZIPPER FLOOR MAKES PRESSURIZING CABINS EASY. Douglas wanted to pressurize the C-124B's crew compartment. But how to handle the floor? It had to stand a total air pressure of 67,000 lbs. And because there was equipment underneath that required servicing, it couldn't be sealed off with a regular sub-floor. B. F. Goodrich engineers devised this rubber sub-floor to do the job. Cables in the rubber give it enough strength to stand 100,000 lbs. pressure. The B. F. Goodrich Pressure Sealing Zipper gives access to equipment yet provides an airtight seal.

2 SEAL ZIPS OFF TO SAVE TIME. Lockheed engineers needed a seal between the elevator and stabilizer on the Neptune to make control easier. An

ordinary fabric seal would work, but dozens of screws would have to be removed every time a control surface was taken off. The B. F. Goodrich Pressure Sealing Zipper proved to be the answer. Its molded lips prevent air flow through the hinge area. Mechanics unzip it in seconds.

3 IT LETS MEN IN—KEEPS FUMES OUT. A standard metal partition between cockpit and fuselage would keep engine fumes out of a jet's cockpit. But it wouldn't let mechanics in unless they removed a lot of screws and bolts. B. F. Goodrich devised a better partition—a fume curtain closed with a Pressure Sealing Zipper. The zipper's rubber lips make an airtight seal, unzip in nothing flat.

4 SHUTS UP TORRENT OF HOT AIR. Designers wanted to make the C-124's hot air duct in six-foot sections. They needed a strong, flexible coupling that would permit easy removal of the sections. B. F. Goodrich Pressure Sealing Zippers solved the problem. They resist heat damage, provide an effective seal, open with a zip.

Pressure Sealing Zippers fit irregular shapes. Can be sewn or cemented. They save space, weight, time . . . Write: The B. F. Goodrich Company, Aeronautical Sales, Akron, Ohio.

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FIRST IN RUBBER

AMERICAN AVIATION

U. S. Jet Transport Program Gets Big Boost

AF ORDERS 717'S—MATS IS INTERESTED

Boeing tanker order may involve 88 planes; Gen. Smith reverses long-time position

By WILLIAM D. PERREAULT

A TURNING point in the U. S. jet transport program has been reached this month as:

- USAF ordered 14 Boeing 717 jet refueling tankers with a reported longer ranging program established to increase the order to 88 planes at a total cost of approximately one-half billion dollars.

- Military Air Transport Service, in the person of MATS Commander Lt. Gen. Joseph Smith, reversed its long-time position on high-speed transports. Said Smith, addressing the annual meeting of The Institute of the Aeronautical Sciences in Seattle: "We believe that there are many compelling and valid reasons for introducing jet transports in the MATS fleet."

- Within a few days of confirmation of the USAF order for the Boeing 717, company president William Allen and executive vice-president Welwood Beall met with CAA Administrator Fred B. Lee to informally discuss certification of the jet transport (*see p. 26*).

Labeling his comments as "personal views," General Smith laid down some basic facts about jet transport work capacity which no one will seriously dispute:

"Over a 2200-nautical mile range, which happens to be the range of the critical leg of one of our routes, one modern jet transport of the type now appearing could, in terms of general cargo, replace: from 9 to 10 Douglas C-54's, from 3 to 4 Boeing C-97's, from 3 to 4 Douglas C-118's, and from 2 to 3 Lockheed C-121C's.

"Moreover, it is obvious that over longer ranges, such as non-stop from the United States to Europe, the savings in support personnel by retiring conventional aircraft would more than offset the capital investment in jet transports."

Commented a veteran airframe salesman, who has been pleading a

similar case for the past six years: "I'm about ready to let 'General Joe' handle my sales pitches in the future. He has better documentation."

As MATS sees it, a "jet transport of the current type," flying 140 hours-per-month utilization in accordance with MATS' peacetime utilization, could deliver 900 passengers per month to Europe as contrasted with 170 for the C-54 and 270 for the C-97 or C-118.

Smith's call for specialized personnel transports, coming a few days after Air Force Secretary Talbott's announcement of the order for "a limited number" of "an advanced version" of the 707 with "considerably greater refueling capacity" could be interpreted as

miles) non-stop; speed not less than 500 knots (575 mph); payload approximately 30,000 pounds or 100 passengers, field length 5000-6000 feet. Smith acknowledged that with present powerplants the 500-knot speed target might not be met immediately.

General Smith was "strongly endorsing the use of the jet transport for implementing" the accepted Air Force policy of airlifting personnel to stations overseas whenever practicable. This didn't mean MATS long-standing praise for the turboprop transport for cargo had been abandoned. "We feel that there is a requirement in MATS today for an all cargo transport that will carry approximately 50,000 pounds



MATS' Gen. Smith and AA's Dan Beard
Challenges are tossed out at IAS meeting

MATS' effort to participate in the tanker benefits as it now does in the Boeing KC-97 tanker program. All production KC-97's are dual purpose tanker/transport.

Actually, his stringent specifications for a personnel transport exceeds what is known of the 707's potential unless the "advanced version" is a major redesign. The requirement: 3000-3500 nautical miles range (3400-4000 statute

of payload over a distance of 3500 nautical miles. Our studies indicate that in the foreseeable future (from the present through 1960), a 50,000-pound payload is about the optimum, if frequency of service and economy are considered."

To expedite turboprop development and thus make such an aircraft possible, said Smith, "I have voluntarily taken on the service testing of six turboprop-powered transports: two C-97

Strato-freighters, two C-121 Super Constellations, and two C-131 Convairs. It should be understood that these tests are power plant tests and do not reflect the capability of the aircraft concerned since the powerplants are not basically designed and matched to the airplane."

As the second speaker on the IAS program, the MATS commander set the tone of much of the meeting, not only in his support and optimism over the jet transport's future, but in his determination that we should take another look at the by-pass engine. Noting that the British have "done considerable pioneering" with the Rolls Royce Conway, the three star general concluded: "It appears to us in MATS that greater impetus and emphasis should be given to the development of the by-pass engine."

There is strong evidence that such development work is underway. Lockheed's Kelly Johnson brought discussions of by-pass engine requirements to a halt with a pointed question as to why the engine manufacturers continue to ignore the so-called turbofan engine if it is truly so advantageous. No one appeared willing to discuss the known development programs underway at two U. S. engine companies, reportedly General Electric and Westinghouse.

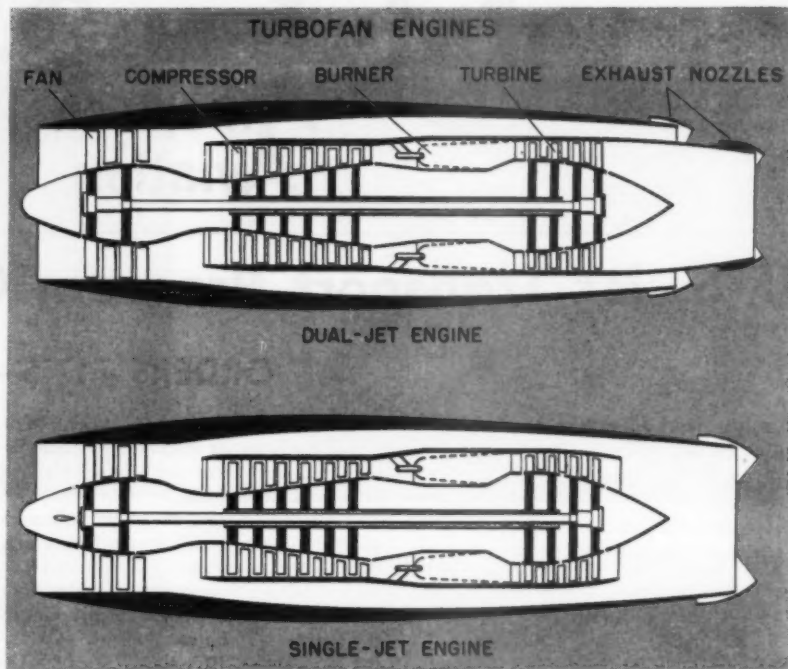
By-pass engines

Johnson was directing his query at American Airlines' M. G. "Dan" Beard, who had just wound up his paper "Air-line Turbine Transport Considerations" with the comment: "We challenge the American aviation industry to build us this (by-pass) powerplant." This was the second effort by AA engineers in recent months to stir greater interest in the engine which had been ignored for many years in this country, primarily due to lack of military interest in the narrow speed-range in which it shows its greatest advantage.

Beard described the by-pass engine (now officially designated "turbofan" in technical circles) as "a jet engine which extracts a portion of its useful energy to drive an extra large compressor at the entry ends of the engine. The excess air pumped by this compressor is ducted around the outside of the 'hot' part of the engine, and is reinserted into the exhaust concentrically with the hot jet."

"The object is to increase the propulsive efficiency of the turbojet without sacrificing its inherent advantages of low weight, low drag, high intake efficiency, and ability to mount in pods. The achievement of this purpose will result in lower fuel consumption and higher take-off thrust."

Essentially Beard's (and co author F. W. Kolk's) claim boils down to this:



Two types of by-pass engines under consideration by NACA.

By-pass engines can assure 10% lower fuel consumption, reducing total airplane weight and permitting a reduction in wing area. Higher relative take-off thrust will further reduce wing area and overall weight. Each square foot of wing area thus reduced cuts the plane's empty weight by over 10 pounds.

"Evidence is clearly at hand, the authors claimed," that a considerable de-pyramiding effect is possible, because reducing the wing area and weight will allow the use of smaller engines, which will further improve the situation. Where all of this stops no one knows. But it is obvious that the availability of such an engine will make long-range transports drastically smaller and drastically more economical."

NACA not optimistic

NACA, which has always played an important role in determining where the U. S. will spend its developmental engine money, is still not as optimistic about the turbofan engine as are the potential users. In a paper co-authored by Abe Silverstein of Lewis Flight Propulsion Laboratory and Bruce Lundin, NACA analyzed turbojets, turboprops, turbofans, and "unducted turbofans."

Experienced hands listening to the NACA paper, titled "Turbine Engines for Transport Airplanes," felt a specific effort had been made to avoid direct comparisons. Lundin, who presented the paper, showed a slide of two possible turbofan arrangements which have been considered (*see cut*). Essentially, the

difference in these two types is that in one, the single-jet, the air pumped around the combustion chamber by the fan joins the hot gases before leaving the engine. In the dual-jet, two concentric exhaust ducts are provided and the by-passed air never mixes with the combustion gases within the engine.

The most apparent conclusion to be drawn from the NACA paper, which itself actually made no specific recommendations, is that the turbofan offered no significant superiority over other transport-type engines. If a transport engine of this type was to be built, an engine in which the by-passed air represented about one and one-half times the air flow through the primary engine and with a fan pressure ratio of about two would be desirable. . . .

Ford to Lease Romulus

Leasing of the Navy's jet engine plant at Romulus, Mich., to the Ford Motor Co. for automotive engineering has been approved by the Defense Department. The proposal now goes to the House and Senate Armed Services committees for approval.

Less than 25% of the \$50 million plant will be used by Ford. The rest will continue to house jet engine mobilization equipment, and Ford will act as caretaker for the entire factory. The plant has been empty since cancellation of a Navy contract for Westinghouse J40 engines, which were to be built by the Lincoln-Mercury Division of Ford.

Symington Calls Soviet 50% Stronger In Air

Sen. Stuart Symington (D. Mo.), frequent critic of the Eisenhower Administration's airpower policy, has resumed his attack, claiming a recent speech by Sen. Leverett Saltonstall (R. Mass.) will lull American people into a false sense of security.

Saltonstall reported the USAF was being steadily strengthened, that new jet aircraft like the Boeing B-52, Douglas B-66, and North American F-100 are in production, and claimed that the old 143-wing AF by mid-1955 could not have been attained.

In rebuttal, Symington made the following points:

- The Russians have "half again as many planes assigned to combat units as the USAF, Army, Navy, and Marines combined."

- While the number of combat wings in the 137-wing force is the same as in the 143-wing program, the number of offensive wings has been decreased in favor of the Air Defense Command. "Such a trend can be fatal . . . because you do not score while you are on the defensive. All you can do on the defensive is postpone defeat."

- "We have far fewer F-100's than the communists have MiG-17's and thousands fewer B-57's and B-66's than the Reds have Il-28's." Moreover, the Air Force now has only one production B-52 and no B-66's.

- The AF has been building up steadily but "the important point is the relative increase in strength of the airpower of . . . the Kremlin."

- Recent lagging obligations for aircraft and related procurement cannot result in anything but reduced aircraft deliveries between 1955 and 1957.

McNarney Says Russia Has Edge In Air

Russian airpower is ahead of us quantitatively and may have an edge in quality as well, Gen. Joseph T. McNarney (USAF Rt.) president of Council, told members of the American Society for Quality Control, meeting in San Diego, Calif. Every effort must be made, McNarney said, to regain qualitative superiority.

"The truth is that today the air is not dominated by American planes," McNarney declared.

McNarney cited the Russian medium and long-range bombers that were recently revealed as evidence that, in the question of quality, "our advantage would seem to be insecure at best." Although approving of Secretary of State Dulles' belief in dependence

upon "a great capacity to retaliate," McNarney cautioned that "quantitatively, at least, we hardly seem ready for the policy of overwhelming retaliation."

Nyrop Offered Post As NWA President

Donald W. Nyrop, former CAB chairman and CAA administrator, has been offered the presidency of Northwest Airlines and is expected to announce his decision momentarily.



Nyrop

The NWA post has been vacant since the resignation of Harold R. Harris last March. Nyrop, who left CAB in October, 1952, after 18 months in the chairmanship, has since been associated with the Washington, D. C. law firm of Klagsbrunn, Hanes & Irwin. His most prominent role in the legal field has been as counsel for the Conference of Local Service Airlines.

In this capacity he spearheaded the local lines' drive for permanency in Congress this year and the pendency of Senate action on that drive was one factor delaying his decision on the NWA post.

Field Narrows In Small Turbojet Competition

Field has been narrowed in the Air Force's current competition for a new light-thrust jet engine, one in the 2000-2500-lb.-thrust category, it has been learned.

Two contracts resulting from this contest are likely it is reported, one for development of a radical type powerplant to power supersonic drones or missiles and the other a more conventional light turbojet engine on which production can begin quickly.

The contract for the latter will possibly fulfill powerplant requirements of the new supersonic target drone

DOWN AND OUT

Over the Gulf of Mexico a Wright Air Development Center volunteer rides ejection seat out of nose hatch of B-47 at 500 mph and 10,000 feet. Seat is automatically driven down by a powder cartridge.



Still in seat, jumper begins to tumble forward as he clears plane. He will soon be upside down. He is still securely strapped to the seat by shoulder harness and ankle clamps.



Two seconds after ejection from the plane belt opens automatically and allows jumper to fall free from seat. As seat falls away cable actuates an automatic timer which causes . . .



. . . parachute to open automatically. Below, Capt. Edward G. Sperry, wearing water wings and USAF high-altitude suit, is assisted to the crash boat.



which will be built by Radioplane Co., a subsidiary of Northrop Aircraft, Inc. Radioplane was recently awarded an AF contract for this project.

Among companies reported to have submitted design study proposals in this small turbojet competition are Allison, Continental, Fairchild, General Electric, Packard, Ryan, and Westinghouse.

Westinghouse May Produce Dart Engines

Westinghouse Electric Corp. is considering production of the Rolls-Royce Dart 1400-hp turboprop engine in the U. S. The idea reportedly has the approval of most top Westinghouse executives and the ultimate decision, it is said, will be made by Gwilm A. Price, president of the corporation. Price is now on vacation in Canada.

Idea for U. S. production of the Dart under license resulted from a request by Convair, which thinks the Dart could be adapted for use on its Model 340 regional airliner. Convair's sales are being hurt by recent orders for the Dart-powered four-engine Vickers Viscount, especially the one for 40 just placed by Capital Airlines.

Under terms of a technical assistance pact between Westinghouse and Rolls-Royce, the U. S. engine builder holds rights to either produce Rolls engines under license or to act as U. S. sales agent for the British firm's power plants.

If Convair decides that price and performance of a Westinghouse Dart would be satisfactory in the 340, the San Diego plane builder will probably try to sell a four-engine Model 340 to the military services before offering it to airlines. First Darts for Convair, if Westinghouse goes ahead with production, would probably be purchased directly from Rolls.

Airlines and IAM Agree To Contract Talks

The threat of a simultaneous strike by ground service and maintenance workers against six airlines is over, for the time being at least.

About 20,000 AFL-machinists working for Eastern, United, TWA, National, Capital, and Northwest Airlines authorized union leaders to call a joint strike if the six carriers did not agree to begin bargaining on a new contract.

Efforts by the National Mediation Board resulted in five of the airlines (all but Eastern) going along with the idea of immediate bargaining sessions. Eastern indicated it would negotiate with the IAM separately.

Industry Offers to Aid In Logistics Planning

First steps toward creation of an aircraft industry technical assistance group on air logistics have been taken in Washington.

Two days of meetings under sponsorship of Transport Air Group, the association of airlift and airfreight carriers, with representatives of transport and engine builders, the Air Transport Association, and the Defense Department in attendance, resulted in general approval of the idea, according to TAG's executive vice president, L. R. Hackney.

The three military services and representatives of the assistant Defense secretaries for research and development, supply and logistics, and applications engineering have taken the TAG proposal under advisement. Meanwhile, Raymond M. Kenney, of the office of transportation under Thomas P. Pike, Assistant Defense Secretary for Supply and Logistics, has been assigned as liaison man.

Under the proposal, the group would be a volunteer one working with Defense planners to establish a new overall logistic system concept. Members would not undertake any long-range research studies (like those being

performed by Rand Corp., Stanford Research Institute, Harvard, etc.) but would provide expert technical counsel on logistics problems.

Companies represented at the preliminary meetings were Boeing, Convair, Douglas, Fairchild, Lockheed, Martin, Curtiss-Wright, and Pratt & Whitney.

AF Interested In F-100 Interceptor Version

The Air Force is showing increased interest in an interceptor version of the North American F-100. A developmental prototype has been ordered, it is understood, and additional orders already may have been placed.

This would bring to three the number of F-100 versions: F-100A air superiority fighter currently in production; F-100C fighter-bomber for which North American already has received a \$86,325,888 production contract; and the interceptor, which may be designated the F-100I.

The F-100 interceptor, if it makes the production grade, would be a competitor of Convair's F-102 and would be designed to replace eventually the North American F-86D, Lockheed F-94C, and Northrop F-89D.

707 SHEARS NOSE WHEEL

On August 5th, making a landing at Boeing Field following a routine test flight, the Boeing 707 experienced a loss of wheel braking. Neither the normal nor emergency hydraulic brake systems worked although all other hydraulic units including the steering, spoilers, and flaps were operating normally. The plane was not equipped with a drag chute nor with Boeing's reverse thrust units which are still in the laboratory stage.

Test Pilot A. M. Johnston, after using 6000 feet of the 10,000-foot runway, steered the plane off the runway onto the relatively soft ground to slow it down. Rapidly running out of airport, he started a sweeping turn around the end of the runway when the nose wheel struck a culvert, ran into some cement blocks, and was sheared off the plane. The photo, taken later in the hangar, shows how remarkably little damage resulted. None of the engine pods struck the ground but some damage to the nose was experienced on the other side of the fuselage where the oleo struck.



Only slight damage

The accident, which will delay the flight test program about 30 days while a new nose-wheel gear is manufactured (by Bendix), was caused by the untimely operation of hydraulic safety fuses in the wheel brake system. Designed to close off fluid flow and prevent complete loss of hydraulic system pressure in the event of a line failure, these fuses became confused when brake system flow increased well above normal due to fluid losses during earlier taxiing tests. Mistaking this high flow for a ruptured line, the fuses simply shut off the flow to the brakes.

New Atom Research Facilities Planned

THE era of atom-powered aircraft, if not yet upon the scene, is at least beginning to show on the industry's horizon. Three firms, planning on stepped-up research in the field, are acquiring research facilities.

Pratt & Whitney Aircraft division of United Aircraft, listed by the Atomic Energy Commission as being at work on atomic aircraft engines, will lease a 97,000-square-foot building as soon as it is completed in October. North American Aviation will furnish \$2.5 million of the \$10 million needed to build a graphite-moderated sodium reactor experiment between now and 1958. The reactor is designed to produce 20,000 kilowatts of heat.

Earlier this month Lockheed announced a new \$10 million laboratory at Van Nuys, Calif., designed to coordinate work on guided missiles with atomic power.

AEC also listed General Electric and Carbide and Carbon Chemical Co. as having atomic aircraft engine projects. Other firms now working in the atomic aircraft field are: Boeing, Convair, Martin, Fairchild, and Bendix Aviation.

Also in the business news as August drew to a close were:

Contracts

Lockheed Aircraft Corp. received a \$5 million Air Materiel Command contract for inspection and repair of 160 Douglas C-54's.

Pacific Airmotive Corp. received a similar contract for work on 123 Douglas C-47's and C-117's, totaling \$1.5 million.

Pan American World Airways will operate and maintain the USAF missile test center at Cocoa, Fla., under terms of a \$13.7 million ARDC contract; subcontractor is Radio Corporation of America.

Ryan Aeronautical Co. now has 25% of its work in the form of prime contracts, as compared to 5% one year ago, with orders for the Firebee target plane and electronic projects credited with much of the increase.

Rheem Manufacturing Co.'s aircraft division has research and development contracts in the sum of more than \$4.5 million, covering work in guided missiles, ordnance, and strategic warfare.

Hiller Helicopters has been awarded a \$1.3 million USAF contract for H-23 helicopter spares. Various kits accounted for an additional \$126,000.

Grumman Aircraft Engineering Corp. received a \$208,000 order for parts for the SA-16A "Albatross" amphibian.

General Electric Co.'s Philadelphia plant is to supply generators and voltage regulators under a \$432,000 contract with the USAF.

Facilities

Fairchild Engine Division of the Fairchild Engine & Airplane Corp. will erect a new factory, laboratory, and office on a 200-acre site at Deer Park, L. I., N. Y., to replace the Farmingdale, L. I., plant, recently sold to Republic Aviation.

Earnings

Fourteen major aircraft manufacturers saw their net income climb 60% during the first half of 1954 despite the fact that sales increased only 3%. The impressive gains were due mainly to the removal of Federal excess profits tax. The increase lifted the return on sales from 2.3% to 3.5%.

Stock splits are being considered by Northrop Aircraft and Thompson Products. Northrop stockholders are due to vote November 18 on a proposal to split outstanding shares two for one. Stock-

holders of Thompson will vote October 4 on a similar measure.

Elsewhere:

Curtiss-Wright Corp. reports six-month net to June 30 of \$7.6 million, up from the \$5.7 million of the first half of 1953. Sales climbed to \$235 million, from \$206 million. Backlog on June 30 was \$783 million.

General Dynamics Corp. reports net earnings for six months ended June 30 of \$8.7 million, up from the previous year's \$6.8 million (Convair figures have been incorporated to make the totals comparable.) Sales fell from 1953's half-year figure of \$297 million to this year's \$291 million.

Bendix Aviation Corp. reports a nine-month net (period ended June 30) of \$17.9 million, up from last year's \$12.6 million, despite the fact that sales fell off from \$478 million to \$469 million.

Sperry Corp. reports a six-month net to June 30 of \$11.8 million, compared with last year's \$8 million. Sales, however, dropped from \$245 million to \$230 million.

Western Air Lines reports a sharp drop in net income for the first half, as compared with 1953. Net fell from \$412,000 to \$271,000. Sharp upturn in traffic, however, was achieved in June and July.

Eastern Air Lines' net profit slipped from \$2.5 million for the first half of 1953 to \$1.5 million for the first six months of this year, despite a 13% gain in gross operating revenues.

THE MARKET . . . industry shows heavy gains

Common stock prices of 16 leading aircraft companies have gained an average of 83% on the two leading stock exchanges in the last 15 months, according to a tabulation made by American Aviation Publications.

All 16 firms showed gains, ranging from \$5.12 per share (Curtiss-Wright) to \$33.75 (General Dynamics). Percentage-wise, the range was from 32% (Douglas) to 214% (Northrop).

Table below lists closing prices on May 7, 1953 (when the "interim" 120-wing USAF goal was revealed) and December 15, 1953 (after Admiral Radford, JCS chairman, outlined airpower expansion, and the 137-wing goal came to light), the 1953 and 1954 highs and lows, and the August 17, 1954 prices. Chance Vought Aircraft is omitted because it was part of United Aircraft in 1953.

Company	May 7, '53 close	Dec. 15, '53 close	1953 High	1953 Low	1954 High	1954 Low	Price Now	Now vs. \$ inc.	May '53 % inc.
Beech	13 ³ / ₈	10 ¹ / ₄	16 ³ / ₄	9	21 ³ / ₄	9 ⁷ / ₈	20 ¹ / ₂	+6 ¹ / ₂	47%
Bell	22 ³ / ₄	23 ¹ / ₄	26 ³ / ₄	17 ³ / ₄	42 ³ / ₄	23 ³ / ₄	41 ⁷ / ₈	+19 ¹ / ₂	85%
Boeing	41 ⁷ / ₈	48	50 ¹ / ₄	36 ¹ / ₄	69 ¹ / ₄	38	61 ³ / ₄	+19 ⁷ / ₈	46%
Cessna	7 ³ / ₄	6 ³ / ₄	9 ¹ / ₂	6 ¹ / ₂	15	6 ⁷ / ₈	13 ³ / ₄	+6 ¹ / ₂	78%
Chance-Vought	.....	.....	.....	.....	38 ³ / ₄	22	34	.....	.....
C-W	8 ¹ / ₂	7 ¹ / ₂	9 ³ / ₄	6 ³ / ₄	13 ⁷ / ₈	7 ³ / ₄	13 ¹ / ₄	+5 ¹ / ₂	62%
Douglas	63 ³ / ₄	81	87 ³ / ₄	60	92 ¹ / ₂	59 ¹ / ₂	84 ¹ / ₂	+20 ³ / ₄	32%
Fairchild	8 ¹ / ₂	9 ¹ / ₄	10 ¹ / ₄	6 ³ / ₄	18 ¹ / ₄	9 ³ / ₈	16 ³ / ₄	+8 ¹ / ₄	97%
Gen. Dyn. (includes Convair)	38 ¹ / ₄	34 ³ / ₄	46 ¹ / ₄	31	74	39	71 ¹ / ₂	+33 ¹ / ₄	87%
Grumman	22 ¹ / ₄	21 ¹ / ₂	28 ¹ / ₂	19 ³ / ₈	39 ³ / ₈	22 ³ / ₈	35 ¹ / ₂	+13 ¹ / ₄	59%
Lockheed	22 ¹ / ₂	27 ¹ / ₂	29 ³ / ₄	20 ¹ / ₄	44 ¹ / ₄	26	40	+17 ¹ / ₂	82%
Martin	13 ³ / ₈	15 ⁷ / ₈	18 ³ / ₄	12 ¹ / ₄	32 ¹ / ₄	16 ³ / ₄	29 ³ / ₄	+15 ¹ / ₂	112%
McDonnell	20	19 ¹ / ₂	24 ¹ / ₂	16 ¹ / ₄	32	19	30 ¹ / ₄	+10 ¹ / ₄	51%
NAA	17 ³ / ₈	19 ⁷ / ₈	22 ¹ / ₄	15 ³ / ₈	43 ³ / ₄	20	40 ³ / ₄	+23 ³ / ₄	135%
Northrop	14 ¹ / ₄	16 ³ / ₄	18 ³ / ₄	12 ³ / ₄	45 ³ / ₄	16 ³ / ₄	44 ³ / ₄	+30 ¹ / ₂	214%
Republic	23 ¹ / ₄	22 ¹ / ₂	27	19 ¹ / ₂	43 ³ / ₄	22	40	+16 ³ / ₄	72%
UAC	36 ³ / ₄	45 ¹ / ₂	50 ³ / ₄	31 ¹ / ₂	68 ³ / ₄	45 ¹ / ₄	62 ¹ / ₂	+25 ³ / ₄	70%
TOTALS	374 ⁷ / ₈	407 ⁷ / ₈	.....	.....	.....	.....	646 ³ / ₄	+271 ⁷ / ₈	83%

Farnborough Climaxes Year of Extremes In British Aviation



Comet III

By JAMES HAY STEVENS

LONDON—1954 has been a year of extremes for the British aircraft industry—the sales successes of the Viscount contrasting with the tragedy of the Comet, the first flights of the unique Midge light fighter and the supersonic P-1 shadowed by the lack of one squadron of Hunters or Swifts, and the imminence of a squadron of Valiants and, before very long, Vulcans marred by the violent demise of the only Victor.

The long time required to test the Comet I belies the intensive research carried out on a national basis by the R.A.E., which has gone on at high pressure since the second Italian accident. A general statement on the technical findings is fervently hoped for before the Society of British Aircraft Constructors display at Farnborough, September 7-12, so that the cloud can be lifted—not only from this pioneer airplane, but from the jetliners built and building in the U. S. and France as well.

Even then, it will still remain for the legal court of inquiry to establish the probable cause, or causes, and for the Air Registration Board and de Havilland to design and make the necessary modifications to the Comet II and III before they go into airline service.

The flying, focal point of the SBAC display, should reveal at least half a dozen airplanes that are new since last year. Taken alphabetically these are:

- Auster AOP9 for Army liaison.
- de Havilland Comet III stretched jetliner (and the Comet II, which is new to the display).
- English Electric P-1 supersonic monoplane.
- Folland Midge, prototype of the Gnat light fighter.
- Hunting-Percival Jet Provost primary/basic trainer.
- Scottish Aviation Prestwick Twin-Pioneer bush feeder liner—a deadline entry this.
- Short Sherpa aero-structural research monoplane.
- Supermarine 525 trans-sonic naval fighter.

Appearance of some of these airplanes is dependent upon completion

of 10 hours flying by the time of the display—no easy task in the exceptionally bad weather this summer.

It is likely that the security authorities will only allow the P-1 to fly past. Even if present on the ground, it will be parked well away, together with the Type 525, Valiant 2, and, if it arrives, the second Victor.

Old bottles expected to appear with new wine are:

- Armstrong Whitworth Meteor, with prone position front cockpit.
- Bristol Proteus-Ambassador, prototype adapted as engine testbed.
- de Havilland 110 twin-jet naval fighter, now with all-flying tail.
- Napier Eland-Varsity, adapted as engine testbed.

• Short Sturgeon TT Mk2, a revised version of naval target tug with throw-off marking equipment removed.

In addition, there will be individual and circus flying displays by the hardy annuals: Swift, Hunter, Sea Hawk, Valiant, Skeeter, Sycamore, 173, Javelin, Heron, Pembroke, Beverley, etc.—and other familiar types, such as the Venoms, Vampire Trainer, Bristol Freighter, Dove, Prince, and so on will be available for inspection on the ground.

Display round-up

Once again listed alphabetically, the principal airline and engine exhibits to be offered by the British aircraft industry are summarized below, together with a note on each company's current activities:

Blackburn and General Aircraft expects to deliver its first Beverley transports to the RAF early next year and has received a repeat order. The engine division is still making piston engines and hopes soon to deliver its first Turbomeca-licensed small turbines.

Bristol may again show a Britannia, but it will be a last-minute decision of convenience depending upon whether the prototype and first production airplanes are not away on tropical trials at Khartoum. The flight testbed Proteus-Ambassador is expected to fly. There are some hopes that more details of the two-spool Olympus turbojet—or even of a missile—will be permitted by security. Bristol also has the BE25 constant-power turboprop and the

simple axial Orpheus to show, probably in model form.

Bristol production is concentrated on: the Britannia, four due off the line this year; the 170, about 175 built; the Sycamore and 173, delivery and orders totalling around 125; the Centaurus, 1000 hours overhaul period, piston engine; the Proteus and Olympus coming along to follow the Avons for the RAF.

The de Havilland Enterprise intends demonstrating the Beaver 2 bush plane and Heron 2 executive transport or feeder liner in flight. De Havilland

MAN ON THE COVER

Max Hymans, board chairman and president of Air France, will become president of the International Air Transport Association on September 13. He will take office on the first day of the Tenth Annual General Meeting of IATA, being held in Paris, with Air France and other French airline members of the association as joint hosts.

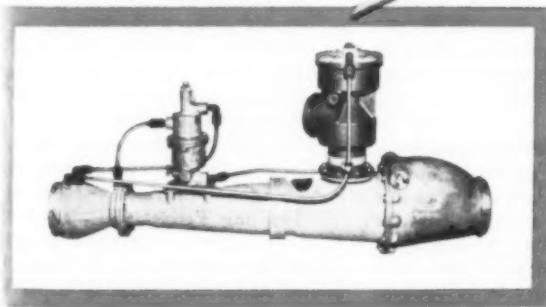
Born in Paris in 1900, Hymans is an engineer and a lawyer. From 1928 to 1940 he was a congressman. He saw combat service as an artillery captain early in World War II. After working in the resistance movement he joined the Free French in England and was subsequently appointed Director of Air Transport for the Free French government. In 1944 he headed the French delegation to the international civil aviation conference in Chicago.

In 1945 Hymans was named first head of the new Civil aviation agency in the French government, the Secretariat-General for Civil and Commercial Aviation. He presided over the third annual assembly of the International Civil Aviation Organization in Geneva in 1948, and subsequently was named board chairman of Air France. Early this year he assumed the additional function of president of the French flag carrier.

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has been showing the former in Europe as well as trying to interest the British Army, and will be bringing the latter to the U. S. for a demonstration tour in the fall. The Vampire trainer will be prominent, since the company is hoping to get it adopted as a NATO jet trainer. The security people have refused to allow the Gyron rugged axial to be shown, but the possibility of a new rocket engine appearing is still in the balance as this is being written. The 4200-pound Super Sprite take-off rocket is to be shown as a parachutable pack weighing 1900 pounds. The results of four years work by de Havilland Propellers' missile section is ruled "Secret" by the Ministry of Defense.

Despite the halt in production of Comets, the plants at Hatfield and Chester have continued to remain at work on Doves, Herons, and Venoms, while the airspeed division is busy with Vampire Trainers. The engine company is in production still with Gipsy and Gipsy-Queen piston types, as well as the Goblin and Ghost centrifugals.

The English Electric Company wants to show its supersonic fighter with the nicked-delta wing planform—already made familiar by the Short SB-5 low-speed flight model—but the security people are still holding out at the time of writing. The feature of this wing is that the ailerons are mounted across the wingtip as a device to avoid aero-elastic load-shedding and turn-tightening. Latest version of the evergreen Canberra (B-57), the B8 night intruder, will be demonstrated individually. This model is coming on the line with the other marks still being built at Blackpool—several of which are available for export off the shelf.

Fairey Aviation, now rolling out Gannet turboprop anti-submarine shipplanes from London and Stockport quicker than the Royal Navy can get them into service, will fly the new trainer variant. The tiny FD-1 delta, built for VTO research with jet deflection control, but never fitted with its special engine, will be demonstrated pretty fast for an airplane with only 3500 pounds thrust. The jet rotor Gyrodyne is a pretty doubtful starter, which is a pity since it is the flight test model (with full-scale rotor head) for the Rotodyne 40-seat transport. Fairey will feature the Rotodyne and the widely used Hydroboosters for flying controls on its stand.

Folland intends to show W. E. W. Petter's Gnat light fighter prototype, the Midge. Even with the low power of a 1640 pound Viper, a maximum speed of over 600 mph is estimated and, with its 5000 pound Orpheus, the Gnat will be transonic. Landing of this tiny airplane *without flaps* will be particularly interesting to watch. The static display backing the Midge will be an equipped



Farnborough regulars hope to see the English Electric P-1 in action.



Folland Midge, 600 mph prototype of the Gnat light fighters.

cockpit to show that it is fully operational and not cramped. Folland has an outstanding production reputation as a subcontractor (Venom wings, Hunter tailplanes, Britannia nacelles) and has 500,000 square feet of floor space to back a claim that it is able to build 50 Gnats a month two years from ordering.

Handley Page is hoping to be able to fly the second Victor—with a slightly longer fuselage and revised tail unit, which is representative of those expected from the production lines next year. The Reading factory is well advanced on two prototypes for the four-engined HPR-3 (DC-3 replacement) and it is planned to lay down a production line for entry into service in 1957. A full-sized fuselage mockup showing passenger and freight arrangements will be the central feature of the company's stand in the static exhibition. Production-wise, the London plants have continued to build Canberras, refurbish RAF Hastings, and engage in "super-priority production" buildup of the Victor line.

The Hawker Siddeley Group, largest entity of the British aircraft industry, will not be flying any new airplanes this year, but can point to an order book for Hawker Hunters totalling \$336 million. The first production Avro Vulcan delta bomber is expected early in 1955. Avro will also show the new honeycomb sandwich construction used for the

NATO delta light fighter. **Armstrong Whitworth**, a company largely devoted to missiles, may be allowed by security to show a newer missile than last year, and certainly will have some of its supersonic aerodynamic test equipment on show. **Glosters** will emphasize the progress of Javelin all-weather fighter production by flying a formation of five. **Armstrong Siddeley**, the group's engine company, intends to exhibit the Sapphire 7 if the Ministry of Supply allows, and will have production Double Mamba, naval Mamba 6 (as in the Seamew) and the long-life Viper 5, as in the Jet Provost and Midge.

The Hawker Siddeley Group has been well occupied with production during the year. Three lines of Hunters are delivering, from London, Coventry, and Liverpool; Javelins are starting to come from Gloucester; the Mambas, Sapphire (also at Gloucester), and Viper from Coventry; the Meteor, on the line for 10 years, is now finished, but the Sea Hawk naval fighter order is nearly complete; and Avro is in process of changing from the Canberra to the Vulcan, with the Shackleton (in Mark 3 form with tricycle landing gear) remaining on the line.

Hunting Percival has its Jet Provost to fly. This is a straight adaptation of the ordinary trainer to take a 1640 pound Armstrong Siddeley Viper 5. If the service trial batch pleases the RAF, a sleeker airplane will be put into full

production. The interesting P-74 jet-rotor helicopter under construction is unlikely to be described in detail. Production at Luton is mainly Provosts, with a fair number of Prince and Pembroke light transports—mostly for military clients.

Napier is an engine company with quite a lot new to show and three distinct lines of development. The 3250 chp compound diesel Nomad is no longer secret and details of the 3000 chp Eland turboprop have also been revealed. Both are in development production for the Ministry of Supply, but Avons are the main output. The Oryx, of 750 gas horsepower, is new. It is a low-pressure turbine "boiler" unit, intended primarily for helicopters and delivering a "working fluid" that can be used as a straight jet or to drive power turbines—with or without power augmentation by after-burning.

Rolls-Royce has more to show than any other engine company—but is also more severely tied by security. There are the many Avons, divided into two main series—those with separate flame cans, and the later ones (the RA14, RA16, RA26) with annular combustion chambers. The Dart turboprop, fully established with over 150,000 flight hours, is a prize exhibit and the company is expected to reveal details of its newer two-spool axial RB 109. It is unlikely the eagerly-awaited Conway by-pass will be permitted to appear, although it has been bench testing for many months. Rolls-Royce has a new line-assembly plant at Glasgow, the main factory at Derby—and Avons are being built by Standard Motors, Bristol, and Napier.

Scottish Aviation will demonstrate, once again, its Prestwick Pioneer, which is proving more than ordinarily useful on active service in Malaya. The Twin-Pioneer bush plane transport, partly financed by the Ministry of Supply for the British Colonial Office, is arousing great interest in out-back countries. It should fly by the end of the year.

Short Brothers and Harland, part state-owned company, is isolated in Northern Ireland and, as a result, has had to develop its own test facilities to a high degree. From this has evolved a flight test program, including the aero-isoclinic Sherpa and adjustable-sweep SB-5 research vehicles. The tailless Sherpa, with rotatable wingtips, is immune from load-shedding, is free from control reversal and wing dropping. Designer David Keith-Lucas claims the aero-isoclinic wing is the only way of achieving the high aspect ratio essential for extreme range at high altitude, coupled with strength for high speed at low level without weight penalty.

Cut-price (\$195,000) naval turboprop slow flyer, the Seamew, is in production for the Royal Navy and the company is building Canberras, is held up on the Comet II's, and is about to start a Britannia line for deliveries beginning in 1956.

Vickers-Armstrongs (air component of Vickers Ltd., Britain's largest armament, shipping, and industrial group) has one new airplane to show, a production story to tell. The Supermarine 525 is a twin-Avon naval airplane swept-wing version of the four-year-old 508 and second stage in development of a new shipboard fighter for the Royal

Navy. The Valiant 2, which has nacelles on the wing to take a backward-retracting bogie undercarriage, will be flown to represent the several Valiants already on equipment development flying and due to form an RAF squadron before the end of the year. The Swift F4, with movable stabilizer, will be flown as a token of the many Swifts built and due for service release after being held up by some development bugs.

There may be no Viscount, since deliveries are urgent, but VA hopes to show one in Trans-Australia Airlines colors.

• • •

News Briefs

Manufacturing

Cessna Aircraft Co. will discontinue production of its Model 190 and 195 series after completion of 14 aircraft now scheduled. Company will continue to furnish spare parts for the aircraft, of which more than 1000 have been sold . . . **First Convair** turboprop YC-131C has returned to flying at Fort Worth after engine rework. Plane has reached 39,000 feet and 330 knots . . . **Bell Aircraft** will provide 10 technical representatives to help the Army in helicopter operations under terms of a \$145,000 contract with the Transportation Corps.

The jet age is the age of the flying boat, says J. W. Sweetser, v.p. of sales for The Glenn L. Martin Co. Sweetser is checking on world-wide commercial interest in the Martin P6M Seamaster.

A new automatic direction finder is due to be distributed within six weeks by Air Associates, Inc. Weight is approximately three pounds; price will be under \$200 . . . **A missile** design department is being set up by the Beech Aircraft Corp. Target planes will also be included in the group's work. Head of the operation will be Dr. James F. Reagan, chief engineer for the Radioplane Co. of Van Nuys, Calif., for the past six years.

A firm has been set up in Buffalo to design and build low-cost training devices. Named the Carmody Corp., the organization has been founded by E. O. Carmody, pioneer in aviation training devices . . . **Douglas** has begun construction of an assembly building for its lightweight attack bomber, the Navy's A4D.

Military

The Nike, ground-to-air missile being built by Douglas, is "still in its infancy as a top weapon," according to Brig. Gen. John B. Medaris, chief

of the Army Ordnance Corps Industrial Division . . . **USAF** recruiting advertising for the current year will be handled by the New York firm of Ruthrauff & Ryan, Inc.

The fact that 42% of the employees covered by collective bargaining contracts in the industry are under three-year contracts constitutes a bar to efforts by two unions to set up separate bargaining units, the NLRB has ruled. At issue were attempts by AFL painters and contractors to sever certain employees at Republic Aviation Corp. . . . **First two** forging presses in the USAF's heavy press program, now being constructed by the Aluminum Co. of America, will not be ready until next February, rather than this fall. Difficulties in obtaining die blocks are cited as the reason.

Civil Transport

Northeast Airlines reports record traffic during July: 74,449 passengers . . . **Allegheny Airlines** carried its one millionth revenue passenger on August 16 . . . **Three radio** stations are being built in Canada by SAS in connection with its polar route to Los Angeles, scheduled to open November 15. The airline will pay the entire cost of the stations at Winnipeg, Churchill, and Frobisher Bay.

Its first cargo Super Constellation (L-1049D) has been delivered to Seaboard & Western Airlines. Wing and fuselage have been modified to raise the gross take-off weight from 133,000 pounds up to 150,000 pounds . . . **A course** in the problems of jet traffic control has been completed by CAA Administrator Fred B. Lee and David D. Thomas, deputy director of Federal airways. Thirty-eight other CAA officials will take the USAF course this year at Moody AFB.

Beech, Hit Hard by T-36 Cancellation, Has Made a Full Recovery

With net earnings up and 15 months of production on its books, firm is confident

By ROBERT M. LOEBELSON

WICHITA, KANS.—Beech has begun bouncing back.

After having a bountiful backlog blasted in half by the USAF's decision to cancel the company's twin-engine T-36 trainer contract last year (just as two prototypes were about to be delivered), Beech Aircraft is now looking to the future with optimism. The firm has good cause: The Navy Bureau of Aeronautics' recent placement of an order for the T-34B promises to lead to many repeat orders. Enough, it seems, to keep Beech in the military plane business for several years to come.

Elimination of the T-36 on June 19, 1953, not only did away with one year's future production (contracts totaled \$95 million), but also caused the company to reduce its labor force sharply, i.e., from 12,211 in March of 1953 to 6801 in August.

Employment has continued downward slightly since that time (6449 in December, 5809 in March, 1954, and 5500 in June), but Beech's vice president and general manager, John P. Gaty, is convinced that the low point has been reached and that employment will now stabilize.

He points out that where fiscal 1953 resulted in a net loss of \$2.3 million on sales of \$140 million, the first nine months of fiscal 1954 (to June 30) produced net earnings of \$2.3 million on sales of \$60 million. Military sales, he added, will be at about the same rate in the future while commercial sales also show "great promise for the future." In other words, future sales will probably be at the present rate of \$6 million a month.

Backlog is significant

Here's how Beech's new orders, sales, and backlog for the last nine months divide between military and commercial work:

- New orders—70% military, 30% commercial.
- Sales—75% military, 25% commercial.
- Backlog—75% military (\$64.6 million), 25% commercial (\$19.1 million).

That backlog figure is significant. Where Beech began the 1954 fiscal year with orders totaling \$102 million and delivered \$60 million in nine months, the company's military and commercial sales brought in \$41 million in new business during the same period. Thus Beech now has about 14 or 15 months of production at present rates on its books and can anticipate more orders, especially as far as the T-34A for the Air Force and T-34B for the Navy are concerned.

Moreover, Beech's other military work involves parts production for two fighters being ordered in large quantities by the USAF—the Republic F-84F Thunderstreak and the McDonnell F-101 Voodoo long-range escort fighter. And additional income will be derived from parts of the Lockheed T-33 and from licensing of the T-34 to Canadian Car and Foundry Co. of Canada and Fuji Heavy Industries Co. of Japan. Jet engine starters (C-26 generator sets for B-47 bombers) are money makers.

Paying dividends again

On the commercial side, production of the Model 18 twin-engine executive transport, the Model C35 single-engine Bonanza, and Model 50 Twin Bonanza will continue. Attempts will simultaneously be made to convince the Army, which purchased 60 Model 50's as L-23A's, that more are needed.

The company's financial recovery is further evidenced by the payment of dividends on the common stock. While no quarterly dividends were paid for nine months after the T-36 cancellation, two special 25¢ payments were authorized by the company's directors

and were paid on June 9 and July 9 of this year. Another special one was paid August 11, and the last—enough to bring dividends for the year to four—will be paid September 8.

While unique in the aircraft industry in that it is headed by a woman (Mrs. Olive A. Beech took over as president after her husband, Walter Beech, died in November 1950), the company is in effect run by a triumvirate. Members of this executive committee are Mrs. Beech, Gaty, and Frank E. Hedrick. It reportedly takes unanimous consent of all three before the company makes any important decision.

Missiles, drones, and jets

But a relative newcomer is making his appearance felt. C. C. Pearson, former president of The Glenn L. Martin Co., is now Beech's vice president-manufacturing and a director of the company for the past year. Under his know-how, the company's production lines are humming with an efficiency more often found in aircraft plants employing 20,000 or more employees.

Pearson, however, has one giant assembly building which he doesn't know how to use. Built to produce the T-36, the facility has 96,000 square feet of assembly space, 14,700 square feet of office space, and 5300 square feet of floor area for utilities and equipment. The column-free building, capable of handling almost any plane but large transports or bombers, now stands virtually empty, but Pearson and his colleagues are confident that Beech will eventually obtain enough work to put the building to use.

Meanwhile, Beech has almost fully recovered from its low point of a year ago. And, Gaty confidently predicts, it will not be long before the company will be a leading contender in the missile, target drone, and possibly even the jet field.

Allison Turboprop Ends West Coast Tour

A west coast tour just completed by the Convair Turbo-Liner enabled the Allison division of General Motors to stage 42 demonstration flights of the turboprop-powered transport in 10 days with no mechanical delays of any kind experienced. The Turbo-Liner had previously been flown on 125 demonstration flights.

The west coast demonstrations included flights at Convair, Douglas, Lockheed, North American, and Northrop. Five hundred personnel at these plants were carried on the flights and many more had an opportunity to evaluate the noise characteristics of the aircraft. Comments on the noise level were uniformly favorable.

THE RISE AND FALL of Beech employment since the end of World War II and in the postwar years is shown in the table below, keyed to significant events in the company's fortunes:

Event	Month & Year	Employment
V-E Day	June 1945	16,541
V-J Day	Sept. 1945	5,007
Korean Action	June 1950	2,158
T-36 Contract Award	June 1951	5,828
Peak Postwar Employment	Dec. 1952	13,136
T-36 Cancellation	June 1953	9,415
T-34B Order	June 1954	5,500

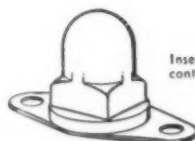
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for integral fuel tank sealing
on aircraft in production



EXPLODED
VIEW



Inseparable self
contained assembly

Attachment of dome nut
During attachment of dome nut, seal
retracts into shell, but remains in
contact with the structure. This elim-
inates pinching and subsequent cold
flow of seal due to gaps which may
exist between shell and the structure.

Installation of bolt
Installation forces the bearing surface of sealed washer to
contact the structure, providing positive single point sealing.

FEATURES

- ★ High pressure sealing without sealing compounds
- ★ Inseparably self-contained assembly
- ★ Single point seal
- ★ Floating nut with stationary seal, unaffected by successive bolt installations
- ★ Reduces Installation Time Weight and Maintenance

SPECIFICATIONS

Self locking nut conforms to applicable requirements of AN-N-5. Floats .025 in all directions.

BUNA-N type seal conforms to requirements of MIL-R-6855 for aircraft fuels Type 1, 2 and 3. It is also resistant to air, salt water, oil, gasoline and most organic solvents. Temperature range: -80°F to +225°F continuous operation. Pressure range ±50 psi constant or fluctuating operation.

SILICONE type seal. Resistant to hot air, ammonia, synthetic oil. Temp. range -80°F to +450°F continuous operation.

The range of materials and sizes now available has been greatly expanded. Pick the part number that meets your specific requirements from the following chart of production types.

Thread Sizes	Steel shell & nut; aluminum washer; Buna-N seal	Steel shell, nut & washer, Silicone seal	Steel shell aluminum nut & washer; Buna-N seal	Corrosion- resistant steel shell & nut; aluminum washer; Buna-N seal
6-32 NC-2	4630H-62	4630HA-62	---	4730H-62
8-32 NC-2	4630H-82	4630HA-82	---	4730H-82
10-32 NF-3	4630H-02	4630HA-02	---	4730H-02
1/4-28 NF-3	4630H-048	4630HA-048	4530H-048	4730H-048
5/16-24 NF-3	4630H-054	4630HA-054	---	---
3/8-24 NF-3	4630H-064	4630HA-064	---	---

NOTE: Any combination of shell, nut, washer and seal materials shown above can be readily assembled for your specific requirements.

Also available in special gang channel designs.

REDUCE YOUR COSTS. Our 12 years' experience with specialized fasteners can help you.

Nutt-Shel

811 Airway
Glendale 1, California
Citrus 4-4191 • CH 5-3693

Manufacturers of self locking anchor nuts and special fasteners.

Can Economical and Efficient Jet Airliners Now Be Offered?

S EATTLE—The U.S. Air Force's order for Boeing 717 Stratotankers is the most important single contract to be awarded in several years. Usually reliable sources indicate the planned program is for 88 aircraft, a figure which would represent approximately \$500 million in business.

Whether or not the final order is for this many aircraft, or for 14 planes in accordance with current Air Materiel Command policies, the order is significant because:

- Jet tanker business is now assumed to be one of the largest pieces of business likely to be put under contract by the USAF for some years. Virtually every large aircraft company, including Douglas, Lockheed and Convair, is now engaged in a design competition for just such a turbine-powered tanker, and this competition was to close within a few days of this date.

- Regardless of the number of aircraft involved, the USAF order will enable Boeing to write-off design cost and production tooling, virtually assuring them a commercially economic aircraft with which to capture a sizeable portion of the world market for jet transports. Boeing is prepared to set up parallel military and commercial production lines, assuring early commercial availability.

At this writing, according to company officials, Boeing does not know exactly what the USAF has ordered. Boeing submitted a number of proposals to the Air Force based on variations of the 707 prototype. It is acknowledged that the 707 is basically too small for the refueling mission and any production model would be a larger aircraft of the Model 717 variety.

How long to produce?

The prototype 707 grosses 190,000 pounds. Boeing, in talking with domestic airline operators, has based its computations on a plane grossing 205,000 pounds. Neither of these figures approaches the USAF requirement. Indications are that the Boeing 717 tanker which has been decided upon will gross about 250,000 pounds and be somewhat larger than the prototype, possibly as much as 30 feet longer in fuselage.

Next big question is delivery dates for production aircraft. Boeing president William Allen limits his comments to: "Within 30 months." This is a very conservative figure based on Boeing's past performances. Also, Allen's comment was made before the

company knew the extent of modifications represented in Air Force Secretary Talbott's comment that the services had ordered an "advanced version" of the jet transport.

Any optimistic view of possible delivery schedules would be to Boeing's disadvantage at this time because it would tip off competitors regarding the important time element in both commercial marketing plans and additional bids for military tankers.

Air Force sources indicate deliveries on Boeing 717's would be likely within 24 months and possibly within 20 months if the final configuration is not too radically different than the prototype. This would coincide with Boeing's production record with the B-47, a relatively complex aircraft.

This schedule could mean military deliveries by fall of 1956 and Boeing officials feel commercial orders could be met a year later. Commercial orders no longer seem remote. Meeting in Seattle immediately following the USAF order announcement, top engineers from such airlines as American and United expressed high optimism about the improving trend in jet transport operating costs.

Boeing's chief project engineer Maynard Pennell, addressing more than 500 members of the Institute of The

Aeronautical Sciences which was holding its annual summer meeting in Seattle, bolstered this optimism. He presented, as part of his paper on the 707, graphs showing operating cost per available ton-mile of the "jet transport" to range from 12 cents at 400 nautical miles down to a low of eight cents at approximately 2800 n.m. As presented this was about 50% lower than the present four-engine transport costs.

When Boeing released the graphs used to illustrate Pennell's paper the cents-per-ton-mile figures had been removed. That the figures were significant to the airline industry is best illustrated by the comments of CAB member Joseph Adams who, after listening to Pennell's paper, said, "You can quote me as saying the 10¢ per available ton-mile figure is mighty significant to the airlines." (Adams sat through the entire three-day IAS session, asked numerous pointed questions during discussion periods.)

What would they cost?

Until now Boeing has been unable to offer the airlines the Stratoliner with any assurance of actual production or reasonably firm cost. The best figure given airlines was about \$4½ million and this was based on commercial orders without military counterparts. The present USAF order should make it possible to lower this cost appreciably (possibly 15-20%), depreciation costs would be down sharply, and operating costs would benefit accordingly.

For European carriers, with some difficulty getting dollars, Boeing is offering the 707 with Rolls-Royce Conway engines rather than the Pratt & Whitney J57. This would mean a dollar savings of about \$750,000 per aircraft, including spare engines, and might be a significant factor.

In its presentations to the airlines Boeing has generally quoted cruising speeds of about 510 miles per hour at 190,000-pounds gross weight. More recently gross weight figures of the 707 have been boosted to 205,000 pounds and the company has generally been referring to the plane as having a speed of 550 miles per hour. This difference is said to be based on cruising at a higher percentage of rated power. Initial studies assumed the conservative figure of 80% normal rated power.

Wing of the Boeing 707 is beefed for higher speeds than presently programmed, the aircraft being thrust-limited initially. Boeing engineers are sure the aggressive engine program under way here and abroad will rectify this.

Meanwhile CAA Administrator

AMERICAN AVIATION

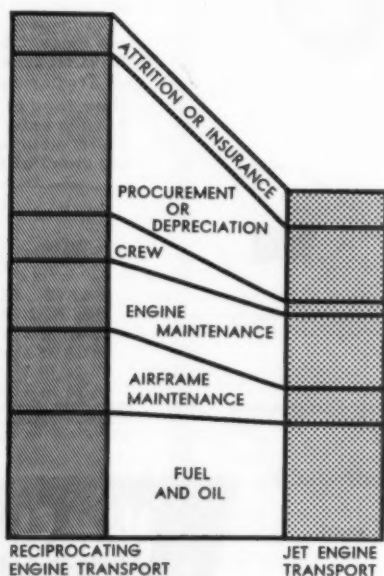


Chart above shows Boeing's comparison of direct operating costs between reciprocating engine transports and jet engine transports.

Fred Lee has met informally with Allen and Boeing vice-president Woodward Beall regarding broad aspects of the jet transport certification problem. Lee promised nothing except to assure Allen CAA is studying all phases of the problem.

The Boeing officials expressed concern over the high certification costs which, they said, would be about one million dollars if existing CAA rules were followed. Allen expressed hope CAA would lower the minimum flight test program below the 150 hours required of piston engine transports to help reduce cost and recognize the differences in the operating problems. Allen told the Associated Press that the 150-hour test requirement would mean 30 transcontinental flights by the 707 as compared with 12 for the Boeing 377 and only five for earlier models.

CAA is considering a Boeing proposal that flights of the prototype military 717, not the current 707 which is a test vehicle, be considered in lieu of some of this flight testing. • • •

Dayton Show to Feature F-102, F-100A Flights

Highlights of Dayton's National Aircraft Show, to be held September 4-6 at James M. Cox Municipal Airport, Vandalia, O., will be first flight demonstrations before the general public of the Air Force's Convair F-102 interceptor and North American F-100A air superiority fighter. In addition, the Army may show off its turbine-powered Sikorsky S-59, which carries the Army designation XH-39.

The AF, Army, and Navy will present flight demonstrations on each of the three days. Time allotments among the services include: AF, 62 minutes; Army, 40 minutes; Navy, 40 minutes.

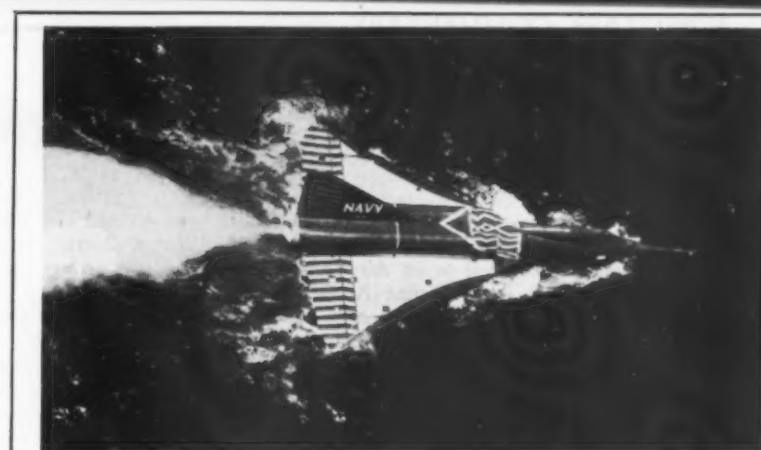
In addition, there will be numerous static displays by the military services and the aviation industry. Nearly 100 manufacturers in the U. S. and Canada will feature exhibits in large hangars at the Vandalia airport.

Plans for four trophy events have been firmed up. They include:

Bendix—Ten Republic F-84F Thunderstreaks will fly from Edwards AFB, Calif., to Dayton on September 4, a total distance of 1900 miles. Last year's record was 603.5-mph average speed accomplished in a North American F-86 Sabrejet.

Allison—In a departure from previous Allison trophy events, four Northrop F-89D Scorpions will take-off on September 5 in accelerated speed climbs and conduct pursuit maneuvers around a B-29 bomber.

General Electric—A North American F-86H Sabrejet, powered by a Gen-



SEA DART IN WHITE CAPS. Convair's XF2Y-1 taxis on the open sea for the first time during rough water tests. Current tests of the hydrojet-equipped fighter are taking place in the Pacific.

eral Electric J73-3 turbojet engine, will try for a world record on September 5 over a 500-kilometer (305-mile) closed course. The present record is 607 mph, held by Sweden.

Thompson—Another F-86H will be piloted on September 6 by Capt. Eugene P. Sonnenberg of Air Proving Ground Command, Eglin AFB, Fla., over a 100-kilometer (61-mile) closed course in a world record attempt. The present record of 690.1 mph was set by Brig. Gen. J. Stanley Holtoner last year at the Dayton show.

Highlights of the individual service flight demonstrations include:

Air Force—Twelve F-84's, sonic boom pass; two Lockheed F-94C's, scramble; Lockheed RC-121, flyby; six F-89D's, afterburner climbs; Boeing B-47 and KC-97, inflight refueling; B-47, Jato take-off; six B-36's escorted by F-84F's, flyby; B-36 carrying F-84F, project Ficon; 12 B-47E's, inbound from England; B-52, flyby; Convair F-102 and North American F-100, flyby; and the Thunderbirds aerobatic team.

Navy—McDonnell F3H, Chance Vought F7U-3, and North American FJ-2, flyby; Bell HSL, Kaman HTK and HOK, Piasecki HRP, Sikorsky HSS, and Rotorcraft RH-1, helicopter demonstration; Lockheed P2V-7 with Westinghouse J34 jet pods, flyby with props feathered; three Grumman F9F-7's, flyby; Goodyear S2G-2 airship; and Blue Angels aerobatic team.

Army—Bell H-13, square dance; H-13 and Piasecki H-25, autorotation; Cessna L-19, de Havilland L-20, and Beech L-23, short take-off and landing demonstration; 14 Sikorsky H-19's, simulated battle demonstration; H-13, patient evacuation and wire laying performance.

Marine Corps participation will be primarily limited to ground displays.

How Federal Airport Aid Funds Are Divided

Congress has approved the CAA supplemental appropriation bill which included \$22 million for the federal aid-airport program.

Of the \$22 million for federal aid, \$1,250,000 is for administration, \$5 million for the discretionary fund, \$250,000 for Puerto Rico, \$225,000 for Hawaii, \$225,000 for Alaska, and \$50,000 for the Virgin Islands. The balance of \$15 million will be divided among the states as follows:

State	Approx. %	Amount
Alabama	1.86	\$ 278,727
Arizona	2.09	313,182
Arkansas	1.49	223,646
California	6.08	911,366
Colorado	2.12	318,423
Connecticut	0.76	113,419
Delaware	0.14	21,660
Dist. of Col.	0.27	40,091
Florida	1.89	283,952
Georgia	1.89	314,140
Idaho	1.54	231,662
Illinois	3.83	573,884
Indiana	1.89	284,246
Iowa	1.78	266,776
Kansas	1.96	294,088
Kentucky	1.63	244,391
Louisiana	1.69	253,533
Maine	0.86	128,589
Maryland	0.98	146,405
Massachusetts	1.71	255,760
Michigan	3.68	551,530
Minnesota	2.38	357,395
Mississippi	1.50	225,350
Missouri	2.44	365,560
Montana	2.57	385,767
Nebraska	1.89	275,084
Nevada	1.64	253,083
New Hampshire	0.33	49,072
New Jersey	1.74	260,556
New Mexico	2.19	328,564
New York	5.79	868,744
North Carolina	2.20	329,819
North Dakota	1.35	201,982
Ohio	3.36	503,700
Oklahoma	1.87	280,487
Oregon	2.07	310,709
Pennsylvania	4.23	634,043
Rhode Island	0.28	42,386
South Carolina	1.21	180,908
South Dakota	1.46	219,086
Tennessee	1.77	266,135
Texas	6.88	1,031,259
Utah	1.60	239,941
Vermont	0.28	42,072
Virginia	1.78	267,675
Washington	1.93	288,357
West Virginia	1.06	158,377
Wisconsin	2.21	331,302
Wyoming	1.68	251,597
TOTAL		\$15,000,000

Balchen's Dream Is Coming True

START of polar route service this fall between Los Angeles and Copenhagen by Scandinavian Airlines System will mean a great deal to an Air Force officer in the Pentagon. He is the long-time Arctic aviation expert and pioneer, Col. Bernt Balchen, who has been advocating commercial polar flights for many years.

Seeing Balchen quite frequently on the Pentagon beat (plus sweltering in Washington's August heat), we thought it a refreshing idea to discuss this polar route business with Balchen.

Although a civilian undertaking, SAS' bid for Arctic traffic will get a firm assist from the military. This will be in the form of Bluie West 8 (BW8), a USAF installation at Sondre Stromfjord, Greenland, where SAS Royal Viking DC-6B's will refuel. Responsible for the base's construction in 1941, Balchen engineered AF clearance for SAS use of this field.

In 1946-48, when Balchen, out of uniform, was president of Norwegian Airlines, part of SAS, he broached his ideas on polar routes to the SAS board of directors who, he said, "at that time thought I was nuts." But through some explanation and simple arithmetic, it didn't take him long to reaffirm his sanity.

Aside from lopping off about 400 miles from the conventional L.A. to Copenhagen route, he told them, the northern way would mean a passenger could fly one plane the entire distance. No airline change or baggage transfer, of course, would mean less time en route. In addition, Balchen explained, the flight would be mostly over land, where weather is usually exceptionally favorable.

"The Arctic area has much more favorable year-around weather than sub-arctic routes," he explained. "Low temperatures encountered are no more severe than those at high altitudes anywhere else in the world. There is less icing, less turbulence, and lower wind velocities."

With electronic aids to polar navigation and today's high aircraft and engine efficiency, such operations in the far north are essentially routine to the military and will be the same for commercial aviation, he said, adding "there are enough alternate fields to start with and more coming."

Looking forward to other routes

SAS' Douglas DC-6B time from Los Angeles to Copenhagen is now set for just over 12 hours. When, and if, the DC-7's come along, this time will be reduced considerably.

Total mileage of the flight will be 5940, compared with 6315 for the L.A.-New York-Copenhagen route. Stops will be at Winnipeg, Canada, and BW8, Greenland. Earlier plans called for a stop at Edmonton rather than Winnipeg, but inadequate facilities at the former city brought about the change, SAS officials said. SAS plans to inaugurate the service November 15.

As in the past, Balchen continues his projected thinking. He is looking ahead to other possible polar

routes and sees even greater advantage in a Europe-to-Japan Arctic air lane than the Europe-to-U.S. The mileage saving here would be more than 1000, he noted.

He foresees Europe to Hawaii as another lucrative possibility. Via Arctic air, the Far East is most efficiently linked to Europe by a line passing over Russia. Balchen casually mentioned this, but here—like the President, State Department, United Nations, etc.—he's stymied about the future.

Anyway, Balchen is looking forward to a booming business along transpolar air routes. He predicts that "within 10 years all air nations of Europe will have such routes between Europe and the U. S. and Far East."

The overall commercial picture in the Arctic will be greatly enhanced, he mentioned, by the USAF's Arctic defense concept which eventually will bring about the establishment of more aviation facilities in the far north.

As for the Antarctic and the South Pole, Balchen feels the potential importance of this area to the military and the airlines does not approach that of the Arctic. This is because the Antarctic is surrounded by vast areas of water.

Other airlines are interested

Although SAS will pioneer Arctic air service on a three-year experimental basis, other airlines have shown definite interest (examples: Air France between Tokyo-Paris, and BOAC between London-Tokyo).

Thus, a dream of Bernt Balchen's is beginning to materialize, just as many of his earlier hopes for Arctic aviation already have become reality. And from his widespread flight experience over and about the North and South poles, he should have the right slant.

It dates back to his Norwegian Air Force duty which began in 1920. He was a pilot on the Amundsen-Ellsworth Relief Expedition to Spitsbergen in 1925. In 1926, he was a member of the Amundsen-Ellsworth-Nobile Arctic Expedition; '27, a pilot with Admiral Byrd's flight across the Atlantic; and '28 to '30, chief pilot of the Byrd Expedition to the Antarctic. More recently, he has been credited with making possible the construction of the AF's huge and vital Thule AFB in Greenland.

Unfortunately, Balchen's present AF post in the Pentagon is not as pretentious as his previous assignments. His current job title goes like this: Special Assistant on Arctic Activities to the Director of the AF Operations Plans Division.

He performs his rather nebulous duties from an unimpressive location at a corner desk in a Pentagon basement room. In general, Balchen feels the AF is failing to exploit his Arctic talent to the proper extent at this time, indicating his workload is hardly enough to keep up his interest. For Arctic advice, however, he is called on frequently by his colleagues.

If this situation continues, Balchen probably will resign and go into airline work up north somewhere.



POSITIONS ARE MECHANICALLY PREDETERMINED
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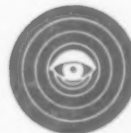
This is the extremely simple and efficient Bendix-Pacific Geneva-Loc Electric Actuator. These Actuators eliminate the human element. The mechanism positively locks the output shaft at each position while the motor comes up to speed under no load and the varying drive

ratio permits power to be applied in a manner best suited for accelerating and decelerating the driven load.

You should investigate the Geneva-Loc Actuator for operating all types of valves, controls and other mechanisms where the positions are predetermined and preferably equally spaced. Also available for high temperature service.

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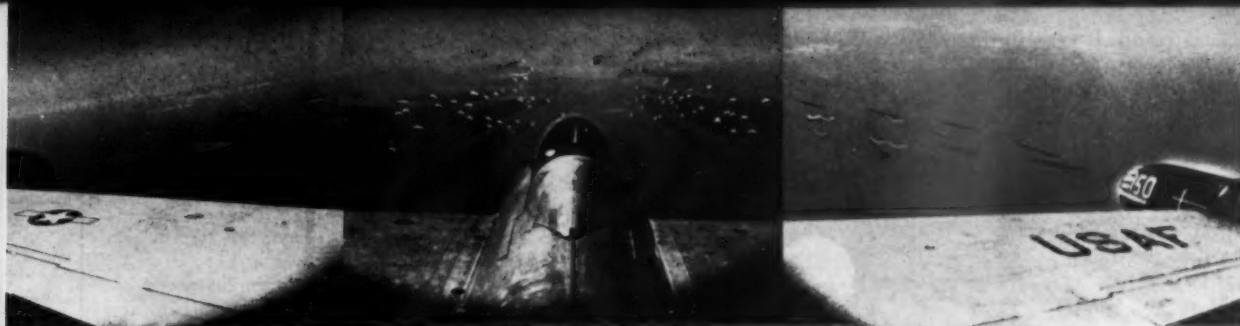
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THE STING OF THE SCORPION is far reaching as seen in this remarkable aerial panoramic photograph which reveals for the first time the tremendous concentration of firepower loosed in a single salvo by America's most heavily armed fighter—USAF's Northrop Scorpion F-89D rocket-armed all-weather interceptor. Three tail-mounted cameras were triggered simultaneously to record on film the bomber-killing punch. The twin, overlapping pattern of the rockets—fired from the plane's wingtip pods—blankets an area as big as a football field. A two-man team—pilot and radar observer—mans the Scorpion, which is capable of 600 mph speeds and can operate above 45,000 feet.

AMERICAN AVIATION IN PICTURES . . .



J. F. (SKEETS) COLEMAN, clad in "G" suit, sneakers, and lifejacket, climbs ladder to cockpit (left) to make first free flight of Convair XFV-1 turboprop Navy fighter on August 1. Above, with canopy open and seat rotated outward to give pilot greater visibility, take-off begins.



ITS SIX-BLADED propeller in full lift, the XFV-1 rises from the runway. Note how heat from engine's exhaust distorts the horizon. This flight was made from Moffett Naval Air Station.



HOVERING a few feet over the runway on this historic first flight with canopy still open is test pilot Coleman. Up to this time plane has not attempted to make transition from vertical to horizontal flight.

BOEING B-52A Stratofortress, first production model in a new series of long-range jet bombers, is shown leaving the ground on its maiden flight at Boeing Field, Seattle, on August 5. B-52A differs from two prototypes in that new type cockpit has side-by-side pilot and co-pilot positions. The bomber, with 80,000 pounds of thrust, has a gross weight of more than 350,000 pounds.



This page for pilots only

ON THE BUSINESS
OF BECOMING
UN-AIRBORNE

Some views expressed by various intrepid birdmen through the ages



"THE MOST IMPORTANT PART OF ANY FLIGHT IS THE LANDING"

—Icarus, son of Daedalus.

Daedalus was the "do-it-yourself" type. He fixed up a couple sets of home-made wings out of wax and took son Icky for a short hop. These were Icky's last words as the wax began to melt. There's nothing home-made about the modern pilot's equipment. To ease the strain in the air he has his auto-pilot. To ease the strain of landing he has HYTROL, the Anti-Skid Braking System. HYTROL can be engaged during approach, ensuring positive directional stability immediately on touchdown.



"I'VE GOT IT FIGURED HOW TO START FLYING. WHAT BEATS ME IS HOW TO STOP"

—Leonardo da Vinci

Leonardo was a whizz at figures of all kinds. However, even he would have been impressed by the figures on the stopping power of HYTROL. Required landing run is reduced 33 1/3 % to 50 %. In other words, HYTROL virtually makes short runways longer!



"YOU MEAN AIRPLANE TIRES HAVE TROUBLE WITH FLAT SPOTS TOO?"

—Fifi Phalsephront,
female fuselage expert.

Fifi may not be the world's greatest aviatrix, but she knows something about pneumatics. Anyone interested in tire life should know about HYTROL. Because flat spots are eliminated with HYTROL, tire life is both lengthened and made more uniform. Tire changes can be anticipated and held to regular maintenance schedules. Premature blow-outs are prevented with HYTROL.



"ANY LENDINK IS HOT LENDINK—
VEN IS ON NICE!"

—"Flat-out" Frijinsky,
Air Hero of the Soviet Union.

What's so tough about ice, Fridge old boy? In C.A.A. supervised tests on icy runways HYTROL gave straight, controlled stops within 50' of certificated distances for dry runway conditions.



"ANY LANDING IS A HOT LANDING—
PERIOD!"

—Cadet before first jet solo.

The lad should have been told about HYTROL. Not only does HYTROL automatically compensate for speed and weight of plane, type of surface, and condition of tires; it eliminates the human element in braking. The least experienced pilot with HYTROL can make better stops than the veteran without HYTROL.



"GREATEST THING SINCE PONTIUS
WAS A PILOT"

—Any pilot who's tried HYTROL,
from Nome to N'Gombo.

EVERY FIGHTER, EVERY BOMBER, EVERY TRANSPORT IS HYDRO-AIRE EQUIPPED

This page for airline presidents

and PILOTS who are GENERALS or ADMIRALS

Let's be serious, gentlemen.

Listed below are seven definite advantages you will gain from the use of the HYTROL Anti-Skid Braking System. Before you read them we should like to make this very important point:

HYTROL is self-liquidating in tire and brake maintenance alone.

The cost of installing HYTROL in proportion to the cost of the airplane it will protect is less than ordering a \$15 extra on your new automobile. And this minor outlay can be returned in a three-year period by savings in routine maintenance only.

Thus, on a self-liquidating basis, you can make HYTROL standard equipment throughout your fleet. You can then consider the advantages listed at right as NET GAINS to your company.

HERE ARE THE PROVED ADVANTAGES OF HYTROL

1. Runway mishaps due to swing, overshooting or late rejection of take-off absolutely minimized.
2. Unforeseeable tire failure virtually eliminated.
3. Bad runway conditions—rain, slush, snow, ice—controlled.
4. Human error neutralized in landing technique.
5. Availability of aircraft increased by marked reduction in last minute repairs.
6. Your reputation with the public safeguarded.
7. Pilot morale boosted.

HYTROL is light, easy to install,
compatible with standard brake systems.

May we hear from you?

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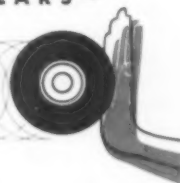
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How Pentagon's New Cost Allowance Rules Will Affect Industry

AFTER many months of internal discussions, a new set of cost allowance principles to replace Section XV, Armed Services Procurement Regulations, is about to emerge from the Pentagon.

Drastically changed in both size and text from the "final" draft of the service auditors last fall, the new rules definitely clarify, standardize, and liberalize auditing procedures and allowances. One of the main complaints of industry on cost-reimbursement contracts has been the wide variance in interpretations of these cost allowances by auditors.

Written in business, rather than legal, language and designed to be helpful to procurement officials in negotiating contracts as well as to auditing personnel in their duties, the proposed new rules are expected to have little difficulty in being finally approved and submitted to industry for review early this fall.

Procurement officials who have held up the new rules now appeared to be satisfied and some Pentagon officials hope that industry comment will be received and final legal changes made in time for publication in the Federal Register before January 1. Publication in the Register would be the final legal step in implementing the rules.

The new Section XV is divided into five parts: General Principles, Cost Reimbursement, Non-Profit, Facilities, and Time and Material Contracts. Each part is being reviewed by subcommittees composed of both auditing and procurement personnel.

Part II is the most important as it shows the basic principles for both direct and indirect costs for cost-reimbursement contracts and will serve as a "guide" to contracting officers in negotiating other contracts.

A number of items in Part II, such as Charities, Excess Facilities, Insurance, Maintenance and Repairs, Manufacturing and Production Engineering, Overtime, Rentals, Severance Pay, have not been changed in allowability from the present situation, but the phraseology has been improved.

The part for Pensions and Retirement is substantially the same but some small improvements have been made. It is also reported that this may be revised at higher levels before final approval.

Some of the items that have been changed from the present Section XV or have been the subject of criticism

within the department or have been rephrased are as follows:

Depreciation

This controversial item has been completely rewritten in the last four drafts of the new proposed rules.

The present rules state that depreciation will be "accounted for by the consistent application of any generally accepted accounting principle" and accepted as an indirect cost. The amount of depreciation "may vary with volume of production or use of multi-shift operations."

Depreciation on idle or excess facilities will not be allowed unless stated in the contract to be for standby purposes.

No depreciation will be allowed on any assets still in use that have been fully depreciated in accordance with the contractor's consistent accounting practice. This is a broad policy that could affect contractors who have obtained substantially full recovery of their costs for emergency facilities through renegotiation and the federal income and excess-profits tax laws.

However, where a contractor has received a determination of "true depreciation" from an Emergency Facilities Board, the amounts so determined for "true depreciation" over the emergency period will be recognized in lieu of normal depreciation. After the emergency period, the remaining portion of the cost of such facility will be depreciated over its remaining useful life.

Patent Expenses

Amortization of the cost of purchased patents owned by the contractor applicable to products or processes covered by the contract are allowable when approved by the contracting officer.

Trade and Business Activities

Membership in trade and professional associations is subject to the overall yardstick of "reasonableness," and to the established practice of the contractor. The approval of costs of larger regional and national groups is also based on whether memberships are held by a majority of like firms in the same industry. The costs of social, cultural, or recreational activities are not allowable.

Advertising

Under this heading all types of media are identified, but only advertising in trade and technical journals

in the contractor's industry is allowed. The first draft of these rules allowed certain advertising for commercial-type products and also accepted institutional advertising in general magazines if the contractor could prove his business was hurt by accepting war contracts.

A second item under this heading allows maintenance catalogs, price lists, and technical pamphlets "which aid users of the contractors products."

Anticipatory Costs

Expenses made before the contract becomes operative are not allowed.

Bidding Expense (Current)

Both successful and unsuccessful bidding expense "will be treated as indirect expense and allocated to all business of the contractor. No bidding expenses of the past accounting periods will be chargeable to the government contract."

Cafeterias, Dining Rooms, etc.

Losses from the operation of cafeterias, canteens, lunch wagons are now considered allowable.

Compensation for Personal Services

This part is the most lengthy of the new rules and, officials state, was caused by numerous complaints of excessive salaries for top executives. The former yardstick of "reasonableness" of the total compensation still holds but "Corporate officials, directors, executives, department heads, partners, and sole proprietors may be subject to special consideration and limitations as to allowability for contract cost purposes."

Such situations may be where: (1) the individual or member of his family owns a substantial interest in the firm; (2) ownership of the contractor is limited to a small cohesive group; or (3) the volume of government contracts when related to the firm's business is such as to influence the amount of compensation.

The cost of options to purchase stock is now allowed. Bonuses are allowed if they are: (1) reasonable in amount; (2) paid in connection with an established plan consistently followed by the contractor; (3) paid for services currently rendered by the employee; (4) available to all employees or all employees in a group or salary classification. Bonuses will not be allowed if they are based on profits or constitute a distribution of profit rather than reasonable compensation for services, if they are restricted to officer or other employee stockholders, or if they are distributed in relation to stock holdings.

Charges for provisions under stock bonus plans are unallowable. All profit-sharing plans are unallowable and the Army and Air Force approve. However, the Navy has entered a strong

protest stating the profit-sharing plans are increasing and becoming an integral part of industrial operation.

Employee Morale, Health, and Welfare

Expenses to improve working conditions and employer-employee relations (such as house publications, first-aid clinics, and employer counseling services) are allowable.

Entertainment Expense

None is allowable except for "meetings when the primary purpose is the dissemination of technical information for the stimulation of production."

Fidelity and Surety Bonds

The cost of such bonds as performance and payment bonds, forgery bonds, fidelity bonds, patent infringement bonds, etc., allowable to the extent required by the contract or approved by the contracting officer both as to type and amount.

Interest

The wording for the item is even more emphatic than the present rule in that no interest of any nature or costs of financing or refinancing of any kind is to be considered reimbursable.

Professional Services

The cost of legal, accounting, and engineering services are generally allowable when reasonable in relation to the services rendered and are not contingent upon recovery of the cost from the government.

Recruiting Expense

This includes "Help Wanted" advertising along with other allowable expenses such as: operating costs of employment offices, educational and aptitude testing program, travel of employees on recruiting duty, and travel of applicants for interviews.

Strikes and Lockouts

Each case is to be considered on its own merits.

Taxes

Allowable except for federal income and excess profits taxes, taxes in connection with financing, refinancing, or refunding operations, and special assessments on land which represent capital improvements. Previously, state income taxes and state franchise taxes partly based on income were unallowable.

Training Expenses

This controversial item allows for all instruction "designed to increase the overall effectiveness of employees." It also includes tuition, fees, materials, and text books when the training is in educational institutions. The Army has taken vigorous exception to this rule and asks that it be entirely eliminated.

West Coast Talk . . . By Fred S. Hunter

- **Howard Hughes holdings up for sale?**
- **Boeing's record is outstanding**
- **Commercial C-130's in the wind?**

This week's \$64 question on the west coast: If it is true Howard Hughes has placed a \$400,000,000 package price on all his holdings, including tool company, aircraft company, TWA, and Houston brewery, who might be a taker?

Another: Now that the tanker order adds another stretch to Boeing's time lead over other U.S. manufacturers, who is most likely to place the first commercial transport order? A lot of guessers predict Eddie Rickenbacker (Eastern) or Howard Hughes (TWA).

In more ways than one, it seems fitting that Boeing should produce the first U.S. commercial jet transport. Boeing equipment has been carrying passengers on the airlines in this country continuously since 1927. Nobody else covers so long a span of time, although Douglas has made more planes. You can even push the Boeing date further ahead by counting in Eddie Hubbard's two-passenger B-1 on the international air mail route between Seattle and Victoria.

The roster of Boeing airline passenger planes includes the single-engine 40A (two passengers) and 40B (four passengers); the tri-motor 80A (18 passengers); the single-engine Monomail (6 passengers); the twin-engine 247 (10 passengers); the 314 flying boat; the four-engine 307 (Stratoliner); and the four-engine 377 (Stratocruiser). Can you name another manufacturer who has produced as many different designs that have been accepted and actually operated in regular service by the airlines?

A Los Angeles newspaper noted recently that the Nike program runs to \$1,100,000,000. A very substantial program, you might say. The Army must think the Nike is a pretty good missile after all. The cost figure got into print in a news story which also disclosed another subcontractor, the Fruehauf Trailer Co., which is manufacturing a trailer Douglas de-

signed so the missile would come to no harm when transported about. Another indication of the extent of the Nike program is the size of the second-source factory at Charlotte, N. C. It contains 1,200,000 square feet of floor space. Used to be a Ford plant.

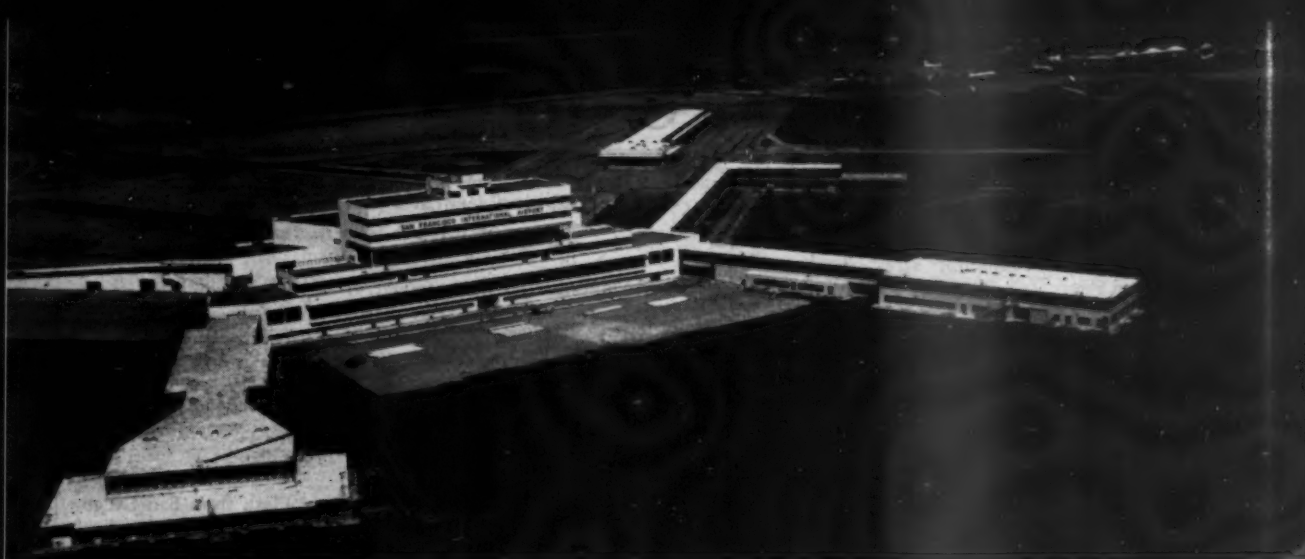


Flash from San Diego says one photographer has a spotter in the tower at the Tijuana airport, keeping a sharp eye on Brown Field across the border, hoping to scoop the world when Convair sends the XFY-1 up for a transition flight. Looks like excess

enterprise. Convair has a whole staff of eager beavers led by such expert operators as E. Jones and N. Root, who are making elaborate plans to see to it that nobody gets scooped on this history-making event—except, of course, Lockheed.

Lockheed still keeps oh, so quiet about a possible commercial C-130, and it may be only coincidence, but it picked Bob Stoessel, its top Super Constellation sales engineer who knows the airlines inside out, to organize a sales engineering department for the Georgia division . . . Of 11 R3Y's being built by Convair for the Navy, six are bow loaders . . . Boeing has begun to get some Ford-made J57 engines for the B-52.

Man we know describes the forthcoming Douglas C-133 turbo-prop as a "big C-130," which sums it up rather aptly at that . . . California will miss Chuck Yeager's good humor and dry wit . . . Barbara Storrs, secretary to Nat Paschall, is the second Douglas secretary to complete 25 years with the company. Cora Pearson, secretary to Parts Sales Manager W. S. Fryer, got her 25-year pin a year ago . . . Fletcher hasn't worked out final price on its new "Utility" and only says it will be "under \$20,000."



An estimated \$89 million a year in business will be rung up in the new terminal.

SAN FRANCISCO — new terminal, new features

By FRED S. HUNTER

SAN FRANCISCO air passengers, accustomed to stumbling over each other at International Airport despite the use of two terminal buildings (domestic and international), have been presented with a long-awaited whopping facility which can accommodate 5,000,000 passengers annually.

From now on customers of the 13 airlines which serve the city (1953 total: 2,429,913 passengers) will arrive and depart on separate levels at the new seven-level-plus-tower terminal building, open for business September 1.

The imposing 130-foot-high structure, which combines striking architecture with functional efficiency, makes San Francisco airport one of the most modern as well as one of the busier air terminals of the world. It's also designed for growth. Finger-like concourses have 27 gate positions but can be extended out and more positions added. Ticket counters can be stretched around the corner to provide more space or take care of more carriers.

This would seem to be sound planning to protect a \$14 million investment in view of the record of growth in air terminal utilization here since the last pre-war year (fiscal 1940-41). Then mainly a facility for United Air Lines, which was practically the whole show in town, the terminal handled 179,420 passengers—about 7% of last year's volume. Currently serving the airport are four international carriers (Pan American, Canadian Pacific, Japan Air Lines, and Qantas Empire), four domestic trunks (American, TWA,

United, and Western), two intrastate carriers (California Central and Pacific Southwest), two air freight lines (Flying Tigers and Slick), and one local service carrier (Southwest Airways).

Briefly, this is the way the terminal works for a departing passenger:

An elevation entrance leads into a vast main lobby of tan marble and stainless steel. Immediately in the center is an information counter. On the two sides are ticket and check-in counters. Ahead is a waiting room equipped with \$75,000 worth of furniture, with towering windows affording an unobstructed view of airport traffic and flanked on one side by a coffee shop, on the other by a bar.

After checking baggage at the check-in counter in the usual manner, passenger is directed toward the concourse where the gate for his departing plane is located. A ramp leads to an individual waiting room at the gate where he can await in comfort the opening of the gate. Movement of the passenger is under cover throughout.

Many extras provided

Similarly, an arriving passenger remains under cover from the time he enters the concourse until he leaves the terminal. He may completely avoid the waiting room since pickup of incoming baggage is in a separate location on the ground floor below.

Passengers awaiting connections or who otherwise have time on their hands will have all the usual airport services, plus a few extras:

- A barber shop with several dressing rooms and showers where passengers coming in from long trips will be able to freshen up.

HERE'S WHAT THE PROJECT COST:

Terminal Building	\$6,775,000
Concourses	1,380,000
Air Mail & Cargo Bldg.	440,000
Service Building	200,000
Central Heating Plant & Utilities	480,000
Aprons, Roads, Walks, Parking Areas	2,223,000
Standby Powerplant	163,000
Reclaiming Land	2,500,000
Total	\$14,161,000

- Two nurseries—one on the ground floor for in-comers, the other on the second floor. (The latter, an elaborate affair, includes coin-operated cubicles equipped with bath tubs and all other necessities for infant care.)

James H. Turner, manager of the Public Utilities Commission, which has jurisdiction over the airport, has installed another innovation to take care of the information booth or counter. The underwriter which receives the trip insurance concession must also provide the information service for the airport on a 24-hour-a-day basis.

The restaurant, which will occupy the entire third floor and be operated by the Interstate Co. of Chicago, is not ready for the opening. Interstate is spending in excess of \$500,000 in outfitting the restaurant under terms of its concession contract. The PUC is out to make this one of the outstanding eating places in a city noted for the excellence of its restaurants.

San Francisco figures put annual business volume of the airport at \$89 million per year. This includes: \$37 million payroll, counting airlines, government, and airport; \$25 million in purchases by airlines and other airport tenants; \$27 million estimated expenditures of airport visitors. • • •

RYAN builds ROCKET MOTORS for 3000 mile-per-hour missiles

IMAGINE a motor powerful enough to propel a missile at speeds exceeding 3000 mph...so powerful that its developed thrust can amount to tens of thousands of pounds. One of Ryan's most challenging current assignments is the complete production of such a motor for an Army Ordnance surface-to-surface missile.

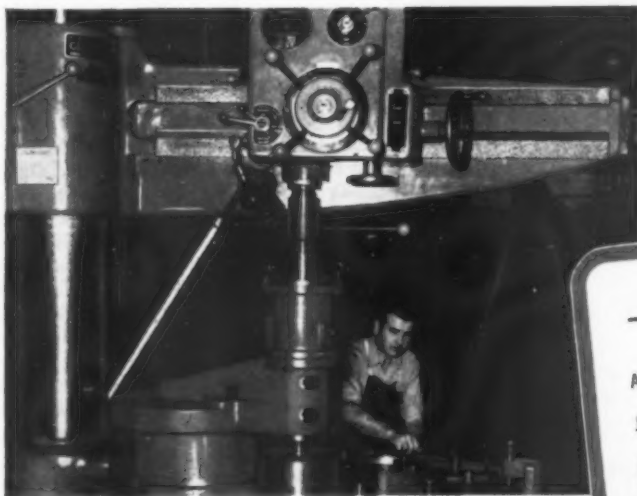
There was a many-sided problem of fabrication, welding and machining that Ryan had to solve in connection with rocket motor manufacture. Because a rocket motor is capable of burning as much as a ton of fuel a minute at temperatures up to 5000 degrees F., terrific internal pressures are created that must be contained in a very compact package of complex construction and exacting dimensions.

The solution was found in perfecting new techniques for forming, welding and machining the special

alloy materials. Ryan devised new methods of controlling work to very close tolerances; ingenious electric resistance and arc welding processes and a better furnace brazing system...plus intricate machine operations that had to be jewel-like in precision.

Ryan's proved ability in the production of complete rocket motors is due in large measure to its long experience in building the "hot end" of jet and piston engines. Its versatility in many specialized fields is an important advantage in each new assignment, for it enables every division to draw on 31 years of first hand experience in the most advanced phases of aviation engineering and production.

Thus, each year more unique technical engineering and production projects are awarded Ryan...an integrated company with superior abilities in meeting the challenges of today's high-speed air age.

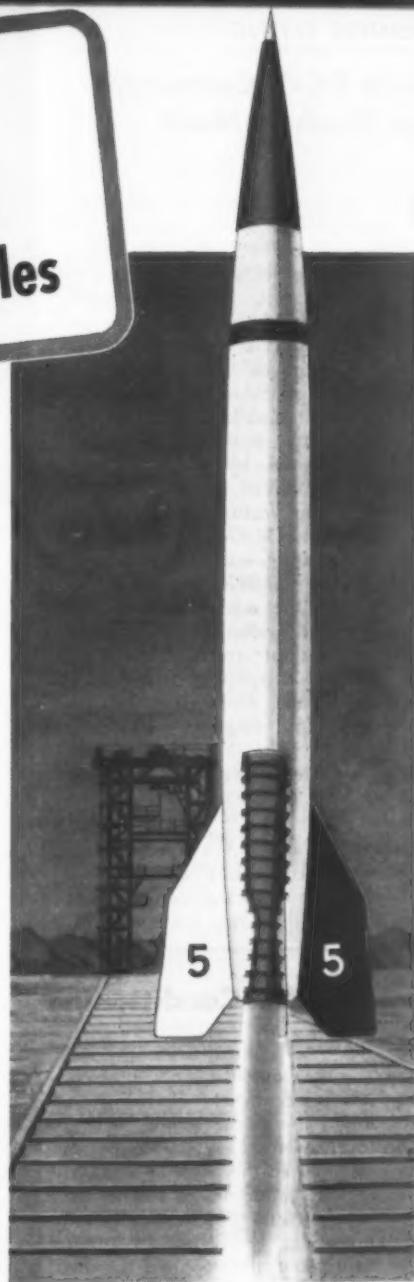


RYAN AERONAUTICAL COMPANY

Factory and Home Offices: Lindbergh Field, San Diego 12, California

OTHER OFFICES: WASHINGTON, D.C.; DAYTON, OHIO; SEATTLE, WASH.; NEW YORK CITY

AUGUST 30, 1954



RYAN →

**SPECIALIZED
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Advanced-type Aircraft
and Components
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Electronics Equipment
Ceramics for "Hot Parts"

Weapons Systems Design
and Management
Aircraft and Power Plant
Research
Metallurgical Engineering
Thin-Wall Ducting
Firebee Pilotless Jet Planes

PIONEERS IN EACH ★ LEADERS IN ALL

BUSINESS FLYING

Plush DC-3 Conversion Has Product Motif

By LOIS C. PHILMUS

ONE of the most attractive and compact DC-3 executive interiors was recently executed by Piedmont Airlines for the R. J. Reynolds Tobacco Co. The outstanding feature of the conversion, the interior, provides seating for 14 passengers in compact arrangements which include two lounges, four full-swiveling reclining seats and four fixed reclining seats. Piedmont installed the interior in accordance with a design and color scheme furnished by Butler-Zimmerman of New York.

Other cabin features include a PA system and an AM-FM radio unit fed into nine separate speakers with individual volume controls. Separating the lounges from the rest of the cabin is a quartersawn walnut bulkhead with draperies. Walnut furniture includes end tables, desk equipped with dictating machine and a specially designed unit for storage, magazine racks, and cabin radio system. To carry out the tobacco company's flying office theme, embroidered camels are used on the curtains.

Formerly a TWA Cargoliner, the DC-3 was fitted with a standard step door and large rear cargo compartment door, and the floor was lowered. Pied-



R. J. Reynolds Co.'s flying office will carry 14 in quiet luxury.

mont considers the cockpit design to be the most unusual feature of the conversion. The custom overhead radio and electrical panels were designed to slant at such an angle that all controls and markings are plainly visible from a normal seating position. More room was provided in the cockpit by removing the bulkhead behind the pilot's seat. Noise level was reduced through extra insulation and floor covering which allow the use of cockpit speakers. Janitrol S-200 unit, mounted forward of the stainless steel galley and storage cabinet, provides heating.



Draperies are decorated with camels.

How An Air Conditioning Problem Was Solved

INADEQUATE air conditioning has been just about the only problem facing executive owners of the Aero Commander. Now the Elliott Flying Service of Davenport, Ia., has come up with a solution in the form of a CAA-approved air conditioning installation kit which provides both ground and airborne cooling.

Entering the air scoop on the airplane, air is dispersed at the center of the cabin. The cooling unit is of the water evaporation type, holding 2½ gallons of water, and is located in the baggage compartment. The wafer box is reached for filling through a flush-type door riveted ahead of the battery access door at the trailing edge of the wing.

A duct is installed through the rear cabin bulkhead into the baggage compartment, up the cabin wall, and through the back of the cabin with the outlet in the center of the cabin roof. A shut-off box is provided with the kit which allows the unit to be controlled at will. The handle is in the front end of the duct in the cabin.



Elliott's Aero Commander installation.

In the Aero Commanders of up to serial No. 120, the unit is hooked up through its present air scoop. In ground operation, the blower is turned on for ventilation.

However, Herbert R. Elliott, head of the flying service, stated that in the newer models: "We have no means of cooling on the ground—only while in flight—and it simply has a retractable scoop, much larger, but similar to the

Bonanza air conditioner scoop."

The unit weighs about 20 pounds and the kit sells for \$550. Approximate installation cost is \$100.

Business Flying Briefs

September 22 has been set for the Southwest Airmotive-Pratt & Whitney Aircraft Engine Maintenance & Operation Forum at SAC's plant at Love Field, Dallas. Registration starts at 9:00 a.m. Three P&W representatives will deliver lectures on current maintenance and operating problems . . . The old Lost Nations Airport in Willoughby (eastern suburb of Cleveland) has been renovated into an executive aircraft field. \$200,000 had been guaranteed in advance rentals by Diamond Alkali Co., Eaton Mfg. Co., M. A. Hanna Co., Thompson Products, Lubrizol Corp., and Pickands Mather & Co. to finance the project. With this, General Aviation, Inc., the field's operator, financed a new 5000-foot landing strip, \$100,000 metal hangar, and modern administration building.

The Amazing Four-Month Comeback Of a Local Service Line

**North Central Airlines,
nearly bankrupt, flourishes
under new management**

By ERIC BRAMLEY

FOUR months ago, the air transport industry was less than 30 days away from having one of its members go into bankruptcy—something that hadn't happened since the Civil Aeronautics Act became effective in 1938.

North Central Airlines, its operating costs up to \$1.25 a mile, losses running at a rate of \$50,000 to \$70,000 a month, unpaid bills totaling \$521,000, and morale at rock bottom, was about to set this undistinguished "first" for the industry. Creditors were closing in fast. And the Civil Aeronautics Board, which had already given the company several mail pay increases, had said flatly that there would be no more.

Yet in four months, North Central has undergone an amazing change from one of the highest cost, money-losing operators to one of the lowest cost, highest profit members of the local service industry.

And one of the significant facts is that service hasn't suffered from the deep expense cuts that have been made. On the contrary, NOR today is running more schedules, carrying more passengers, and giving better service than at any time in its history. Equally surprising is that fact that there have been no wholesale firings; NOR has about the same number of employees now as it had in March.

Principal credit for pulling NOR out of the hole goes to Hal N. Carr, who took over as president in April. Carr, who at 33 is the youngest U. S. airline president, had been with NOR (then Wisconsin Central) from 1947 through 1951 after four years on TWA's executive staff. He left Wisconsin Central to join McKinsey & Co., management consultants, and returned to NOR this year at the urgent request of the directors, who thought he was the man to avert bankruptcy.

Carr refuses to take all the credit for NOR's metamorphosis, however. He points out that the company's success has been due to the assistance and suggestions he has received from employees—pilots, mechanics, station personnel, etc. One group offered to take a pay cut; some station personnel volunteered to work a week without pay. Neither offer was accepted by Carr. "If the company can't pay the going rates, it shouldn't be in business," he states.

Carr's first step on taking over the reins was to ask the company's major creditors to go along with him for at least three months to see what improvements could be made. All the creditors agreed. Next, he started a four-point program:

- Expense reduction.
- Raising of equity capital.
- Modification of route structure.
- Work with CAB to establish a permanent mail rate for the company.

The expense cuts that have been made have driven NOR's costs for its 18-plane DC-3 operation down from \$1.25 a mile in March to 96¢ a mile in June, probably one of the outstanding cost-cutting records in the industry. Carr attributes the improvement to three factors: (1) use of scientific management techniques, (2) increasing the scope of operations, (3) coopera-

tion of employees, who are doing a better job with less expense.

Carr immediately knocked \$26,000 a year off costs by consolidating almost all of NOR's activities in one hangar at Wold-Chamberlain Field. Formerly, general offices were in St. Paul, overhaul and maintenance were in one hangar at Wold-Chamberlain, line maintenance in another, and flight control and dispatch in the terminal building.

Engine overhaul was being performed by Gopher Aviation in Rochester, Minn., but NOR was maintaining the inventory of engine parts, paying a stockkeeping fee, and insuring the parts. This has now been eliminated—almost all of the \$60,000 inventory was sold to Gopher.

Cost-cutting then got under way department by department. In one month, \$27,258 in expenses were eliminated—over \$300,000 a year. Here are some examples of how, in one month, expenses were reduced:

Maintenance:

\$7,800 a month saved by improvement in maintenance techniques and operating times, and by some personnel reduction. Overhaul time on airframes was increased from 8000 to 9000 hours, engines from 1000 to 1100, and propellers from 2000 to 2200. NOR is now working toward more increases.

Operations:

\$7,305 monthly saved. Examples: improved operating procedures, \$5,500; modifying and simplifying operations manuals, \$500; chief pilot now flies the line 30 hours a month, \$300; improving teletype spacing, \$90; altering flight clearances and forms, \$100.

Traffic and sales:

\$7,845 saved, with the principal reduction being a \$5,000 cut in advertising. Instituting a \$1.50 service charge on passes saves \$450. Northwest Airlines now handles downtown Detroit reservations and ticketing, saving \$700. A few personnel were also eliminated.

General office

\$4,293 saved through better administrative control and techniques, consolidation of office and maintenance facilities, and cancellation of insurance on assets sold.

An outstanding example of employee cooperation was the pilots' offer to cut one minute off each flight over each route segment. Result: in one month, cost per mile for gasoline dropped from 12.9¢ to 12.3¢. Pilots have concentrated on improving procedures, eliminating excess flying wherever possible, saving time, gasoline—and money. In June, flying operations



Hal N. Carr



Alvin Niemeyer

expense was 30.34¢ per mile, lower than most local service lines.

In the same month, captains were paid for 3229 hours schedule time, whereas they actually flew only 3086 hours. The reduction in flying hours resulted in an overall saving to the company.

Niemeyer heads operations

Alvin Niemeyer, brought in by Carr as operations manager, found—and changed—operating procedures that had been in effect since NOR was flying Lockheed Electras. Niemeyer, a veteran in aviation who had been with CAA since its inception, also reduced

landing minimums by using commercial broadcasting stations as let-down aids, eliminating unnecessary flying, reducing instrument operations, and increasing schedule reliability.

At the same time that costs were being cut, operations were being increased. In March, NOR flew 358,000 miles with plane utilization of 4 hours, 28 minutes daily. In August, mileage was 535,000 and utilization 6 hours, 30 minutes. "Here was a company losing its shirt, yet its planes were sitting on the ground while communities were demanding more service," says Carr.

Between Milwaukee and Chicago, NOR was operating 12 round trips

daily. Carr decided that planes with long turnaround times in Chicago could fly several Milwaukee shuttles, and that a 31% load factor would cover the added costs. He upped the service from 12 to 22 round trips daily; load factor in the first month was 47% and has stayed up ever since.

Passengers were complaining

It was no secret that NOR passengers were complaining bitterly about late schedules, poor service, dirty airplanes, lack of courtesy. Airplane exteriors are now identical (formerly, some still had Wisconsin Central markings), interiors have been renovated (five more seats per plane will soon be added, for a total of 26). Stewards have been replaced by stewardesses, and coffee and cookies will be served. A courtesy campaign is underway. On-time performance has improved. Result has been that passenger comments received by Carr are now over 99% favorable.

Improved employee and community relations have been high on Carr's agenda. Within the company, he has personally reviewed problems and plans with over 500 of the 650 employees, either individually or in groups. All employees are now kept up to the minute on policy and progress.

In the 44 cities on the system, he has appointed "presidential advisers" who are prominent businessmen. Each receives a plaque and a card, and can be called upon for advice on local problems. Result: community relations have improved 100%.

Proof of the pudding

What have been the results of cost-cutting, more frequency, and improved service? In the first four months of 1954, NOR lost \$229,000 (Its 1953 loss was \$100,000). In May and June it netted \$67,000. The operating cost of 96¢ a mile was considerably under the local service industry's May average of \$1.10.

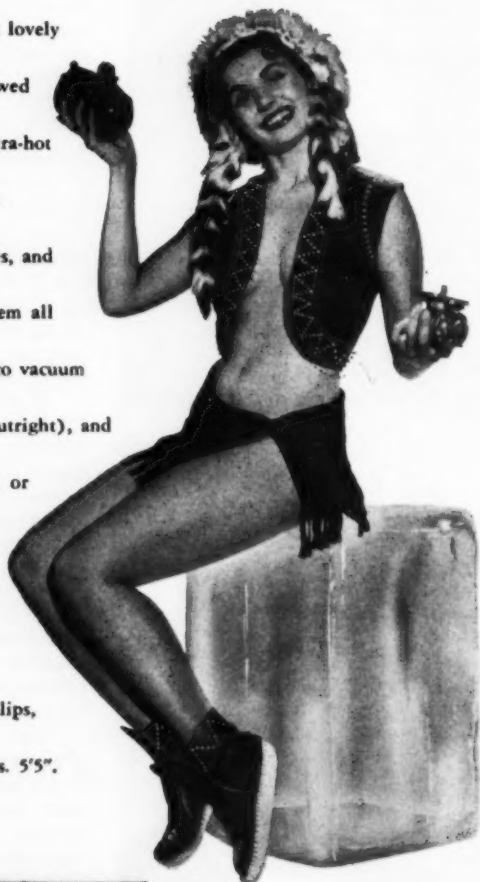
In May, June, and July, NOR carried 82,023 passengers, compared with 64,719 in the same months last year. August is estimated at 35,000.

The company is now paying about three months of its long overdue bills every month. This month, NOR made a public offering of \$300,000 of convertible debentures, which Carr expects will be oversubscribed. This money will clean up all obligations.

During September, NOR expects to have its final mail rate established by CAB. And it is currently analyzing its route structure so it can recommend certain additions, deletions, and alterations to CAB.

Model PERFORMANCE!

Accessories seen here include a lovely young lady, an Indian rig borrowed from the Dobbs House, two extra-hot items overhauled by Southwest Airmotive for exchange purposes, and a 100-lb. cake of ice to keep 'em all cool. Held aloft are a 207J Pesco vacuum pump (\$65. exchange or \$85. outright), and a 4100 Pesco Fuel Pump (\$30. or \$45.), both for R-985 engines. The Pocahontas-type accessory about which this summertime idyll is woven is Carmen Phillips, 18, black hair, blue eyes, 119 lbs. 5'5".



Capital's Order for 37 More Viscounts Is Britain's Top Export Sale

Option is taken on 20 more planes; financing is arranged by British firm

By ANTHONY VANDYK

IN exercising its option to buy 37 Vickers Viscounts in addition to the three for which it placed a firm order this spring, Capital Airlines has signed up for the largest single purchase ever made of a British commercial transport. Involving \$45 million, it is also by far the largest single commercial dollar export order placed with a British company in any industry since the end of the war for any commodity, plant, or equipment manufactured and assembled in Britain.

Capital has taken an option on an additional 20 Viscounts with the intention of standardizing its entire fleet with a total of 60 of the turboprop transports.

Delivery of the Viscounts to Capital will start in March 1955. The first three aircraft are scheduled to be received between March 15 and March 31 and to enter service in April. The 40th plane will be delivered by August 1956. Should the option on the additional 20 planes be taken up, delivery of the balance would be completed between September 1956 and February 1957.

The order is being financed by Air Finance Ltd. This company was formed in London last year to help the British aircraft industry enlarge the market for its products, and particularly the export market, by enabling manufacturers to offer credit terms "where that is considered necessary and desirable."

Orders total 143

Sponsored by several big London financing houses and the Finance Corporation for Industry, Air Finance Ltd. has an issued capital of \$2.8 million subscribed by these concerns and by leading firms in the British aircraft industry (including Vickers-Armstrongs and Rolls-Royce). In addition to normal banking facilities, the company has special loan facilities of up to \$28 million from the Finance Corporation for Industry, and the "cooperation" of the British government's Export Credit Guarantee Department.

Vickers now has firm orders for 143 Viscounts and is stepping up production to eight a month so as to keep the promised delivery dates to new

customers down to two years. As of early August, 36 aircraft had been delivered; another 12 will be delivered before the end of the year. The plan is to deliver 55 Viscounts in 1955, about 90 in 1956, and "100 plus" in 1957. Vickers believes that in the next 10 years most of the 3000 airliners now operating stages of under 2000 miles must be replaced and that 300 to 500 of the replacements could be Viscounts.

While planning for increased production, Vickers is constantly improving the Viscount design and modifying it to meet requirements of individual customers. For Trans-Canada Air Lines, for example, the following modifications are being incorporated: a third wiper on the center cockpit window; redesign of water system to incorporate a purifier; redesign of the cabin air system with AiResearch pressure controllers and Janitrol heaters; elimination of the autopilot (Smiths SEP2); and installation of NESA electrically heated cockpit windows.

What Capital wants

Equipment specified by Capital includes: fixed crew-oxygen; Capital's own public-address system; elimination of the window normally provided for the radio operator; installation of the full Rotol automatic engine synchronization system in place of cockpit synchroscopes.

About 14 of Capital's 40 Viscounts will be the new Viscount 700D model. This uses the more powerful RDa6 version of the Dart (present version: RDa3), giving 1550 instead of 1400 shp for take-off and in having a fuel capacity of 2342 instead of 2066 gallons (there is a new four-tank fuel system

providing individual feed to each engine).

The RDa6 Dart also has a lower gear ratio, giving a 10% reduction in cruising tip speed. This is expected to lower the propeller noise level. To absorb the additional power without increasing propeller diameter the 700D has "high-activity" propellers.

These changes give improved performance throughout the range scale, but particularly at the extremities. It increases maximum take-off weight from 57,000 to 60,000 lbs. and maximum landing weight from 50,000 to 54,000 lbs. Cruising speed at mean weight is up from 303 to 320 mph.

Fuel consumption improves

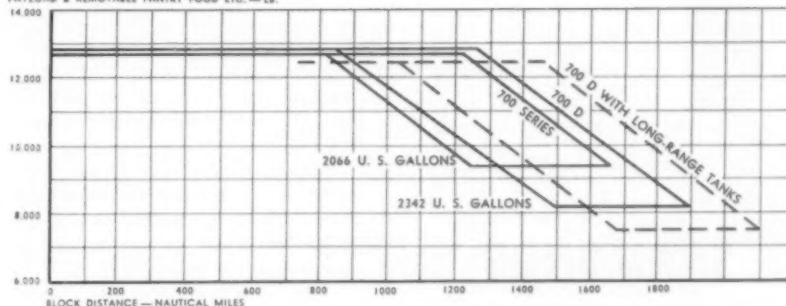
On short stages, the 700D can carry its maximum payload of 12,800 lbs. as well as fuel reserves whereas previously, on some shorter routes, payloads have been restricted by the weight penalty of fuel reserve requirements. Moreover, improvement of specific fuel consumption means that on short ranges the greater payload can be carried for the same total fuel consumption as that of the earlier Viscount.

At the other end of the range scale, increased engine power combined with the increased tankage and lower specific fuel consumption enables the 700D to carry the same payload as the present Viscount but over greater distances. With an associated payload of 8200 lbs., the maximum still-air range is increased to 2190 statute miles.

Furthermore, the Viscount 700D is engineered to be equipped with two auxiliary slipper tanks providing an additional 348 gallons of fuel. This enables the take-off gross to be increased to 62,000 lbs. and raises the maximum still-air range (with 7450 lbs. payload) to 2410 statute miles. The slipper tanks are positioned outboard of the outer engines on the leading edge of the wing. Although not droppable they are easily removed. • • •

Improved Payload/Range Performance of 700D

PAYLOAD & REMOVABLE PANTRY FOOD ETC. — LB.



Payload/range curves for the 700D in normal and long-range forms compared with those for the 700 series. Lines on left of each parallelogram show payload/range with allowances for ¾-hour holding at 5000 feet on four engines and a 200-mile diversion.

HUMAN ENGINEERING GUIDE FOR EQUIP- MENT DESIGNERS

Compiled by

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Navy Electronics Laboratory
San Diego, California

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Extra Section . . . By Joseph S. Murphy

**At last we have a way of finding what we
are looking for in a hurry in the CAR's**

AFTER having long been associated with the confusion and sometimes near desperation of trying to file, find, or just figure out where I had seen a particular Civil Air Regulation, it was something of a pleasant surprise to hear earlier this year that M. B. (Yank) Spaulding had undertaken to solve the problem.

As one might suspect, his efforts are going over in a big way. At last count the number of subscribers to his new loose-leaf edition of Civil Air Regulations had passed 100 and orders were still coming in from points as far away as Alaska, Holland, and Italy.

Spaulding has, in short, reorganized the cumbersome combination of CAR's, special regulations, and CAM's so they can be more easily used, added a word index so that you can find what you are looking for, and (for a fee) promises to keep any one or all of them up-to-date within two or three weeks of action by CAB or CAA.

In the past it was necessary to buy CAR's from the Government Printing Office, go to CAB for all revisions or special regulations adopted since the last printing, and then try to catch all the CAA manual policies, interpretations, or supplements as they appear in the Federal Register. It added up to quite a confusing file.

Spaulding is offering to do all the monitoring of the Federal Register and reprint the rules promptly after they appear, using 5 x 7 inch looseleaf pages indexed for easy filing and color-coded for easy identification.

When CAR's are amended, the change is spliced right into its proper place with the previous wording left in but overlined so the reader can compare the new and the old.

An even more attractive feature is that the preamble to all rule

changes, which is the only place where CAB explains the reason for a change, is reprinted in Spaulding's CAR service. This has always been one of the basic shortcomings of the conventional CAB printing, since once a regulation moved from the amendment stage into formal printing of the Part, all explanation disappeared.

One big advantage to the frequent user of regulations is that the service can be bought for any number of CAR's from only one to all. Aircraft manufacturers interested in CAR 4b and, possibly, the operating regulations in Parts 40, 41, etc.,

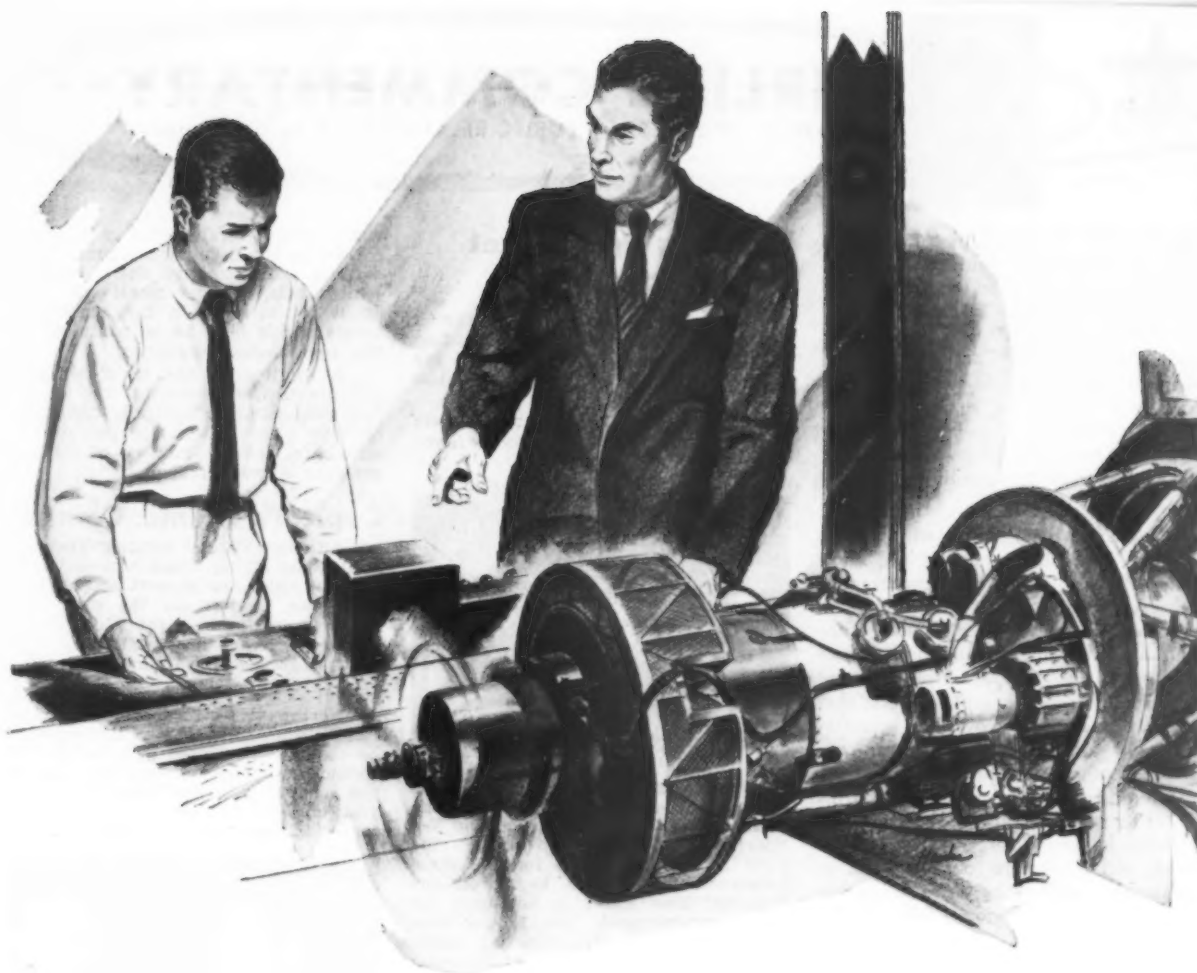
can buy the service and from then on expect to receive all changes affecting them as they happen. Private pilots, executive aircraft owners, airlines, and fixed-base operators can be served by a "package" arrangement which puts an end to the bother of keeping posted on changes or reprints and of sending endless purchase orders for nickels and dimes to GPO.

If a subscriber needs help on what rules affect his particular operation, that service is available too. Or, if a customer wants help on locating a particular requirement or information on all of those affecting a particular situation, Spaulding offers consulting service.

To handle this entire operation Spaulding has formed the Rules Service Co., with offices at 1001 15th St. N.W., Washington, D. C.

Although the final price tag for resubscription service hasn't been fully decided, Spaulding estimates that it will run about 50-60% of the initial year's subscription rate. In other words, the current price of a complete set of his Civil Air Regulations runs \$53.50 with revisions the first year. For service in subsequent years, the estimated fee will range from \$26 to \$31.





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AVIATION PRODUCTS



AIRLINE COMMENTARY

• TRAFFIC • SALES • PUBLIC RELATIONS • by Eric Bramley

AT THE Western Union counter in the Denver air terminal is a poster telling customers how to send an arrival wire. It says: "Example: Arrive New York Grand Central Station first section Commodore Vanderbilt at 5:48 p.m. standard time August 20. Please meet me." Might be a good idea for WU to wake up. It probably does far more business with telegrams regarding airplane arrivals than train arrivals.

Here's an angle that will interest airlines, particularly those in the international field which are encouraging off-season travel: Curtis Publishing Co. reports that rapid development of office and home air-conditioning may hasten the trend in that direction. "Some travel authorities," it says, "suggest that many people are 'discovering' a preference for working and living in air-conditioned offices and quarters during the midsummer heat and taking their trips in other parts of the year when the climate is more congenial and when roads and resorts are less congested, or steamship and plane reservations to overseas areas are more easily obtainable."

People in aviation will probably want to see "The High and the Mighty," the movie based on Ernie Gann's book of the same name, covering a Hawaii-U. S. flight that loses a propeller and just barely makes it. But as far as its effect on potential passengers is concerned, we'd just as soon the movie had never been filmed. Our opinion is that it will keep people off airplanes. Incidentally, the tricky job of installing the "drooping" engine on the DC-4 for the movie shots was done by Transocean Air Lines.

Around the industry: Indications are that 40-lb. domestic baggage limit is keeping some traffic away from the airlines—particularly vacationers and college students, who carry a lot of gear . . . Congratulations to American Airlines for continued high quality of music and commercials on "Music Till Dawn" radio program . . . Bill Spencer, Continental's publicity director, and Tom Dempsey, interline and agency, mailing their friends deeds to one square foot of Pikes Peak. Idea originated by Airborne Perishables, Denver . . .

Boarding Pass-Ticket Saves Money

Trans-Texas Airways is using a new combination ticket and boarding pass that is saving about one cent per passenger. It got the idea from a bus line's ticket.

TTA formerly had separate tickets and envelopes, the latter carrying flight



number, name, and date for gate pass purposes. Envelope has now been eliminated and a hard cover placed on the ticket itself. Space is provided on the right side of the cover for the same information that used to be on the envelope. New ticket is not used for interline passengers. The 1¢ per passenger saving is in material alone. TTA says agents are also enthusiastic about the convenience.

Piedmont Commuter Plan

Piedmont Airlines has decided to use its round-trip commuter travel plan again this winter, and has filed appropriate tariffs with CAB. If approved, the fares offering reductions from normal fares of about 27%, will become effective September 15 and will last until April 30 of next year.

PAI's previous commuter tariff expired April 30, 1954. Generally, the commuter fares are limited to points in North Carolina and Virginia, and allow a passenger 48 hours to complete his trip. Between Newport News and Richmond the time limit is 36 hours.

One pronounced change from the previous tariff—all fares have been rounded up to next nearest dollar.

International Tariffs

The international tariff situation, never the simplest thing for reservations or ticket counter personnel, looks like it is going to get worse before it gets better. On October 1, according to all indications, the consolidated tariffs of IATA Agent W. D. Barrington will cease to exist.

This means that Barrington fares

will have to be transferred to individual carrier tariffs. Even though some of the carriers will combine their fares in joint tariffs, the net result will bring about an increase in the number of tariffs which have to be consulted for the complicated itineraries.

A solution to the tariff situation will not happen overnight. The simplified publication of literally thousands of fares which have to be tied in with an almost infinite number of routings presents a real problem.

Capital's Theme: Comfort

Although Capital Airlines' Viscounts will reduce flying times between many pairs of cities, the present accent, publicity-wise, centers on the expression, "A new concept in flight which transforms air travel into something more than a race against time."

Northwest Airlines, which took off from Minneapolis to give three parties of observers a better look at the 76-second total eclipse of the Sun, June 30, has something to look forward to. Next year, on June 20, Manila will see a total eclipse lasting for seven minutes.



THE FRYE Airline Performance Trophy for 1953 has been awarded to Pan American World Airways for its pioneering in use of "jet streams" in commercial operations. Vice President Richard M. Nixon (left) is shown making the presentation of the trophy to Pan Am president Juan T. Trippe. Pan Am, by using the jet streams as 80 to 100 mph tailwinds, flies the 3846 miles between Tokyo and Honolulu in 11½ hours, an average block speed of 334.44 mph. The award was established in 1952 by Jack Frye, now president of General Aniline & Film Corporation and pioneer in commercial airline operations.

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Post Office Is Reported Uneasy Over "Open Rate" Status of Trunks

THE Post Office reportedly is getting uneasy over the "open rate" status of the domestic trunk airline industry, but to date there has been no unanimous industry proposal for a new service mail rate structure.

Recently, representatives of the 13 carriers and the PO met with CAB staff people as the situation appeared to be coming to a head. One of two things could result: the industry could get more time to adopt a unanimous rate structure proposal, or CAB could issue a show cause order proposing a structure of its own.

But in any event, the PO's unsettled feeling stems from the fact that both the industry and CAB are thinking in terms of adjusting service mail rates but leaving the total annual mail pay bill of the PO intact.

Big carriers may lose

For the larger carriers such as American, United, TWA, and Northwest, it could mean a reduction in rate and total pay. For the remainder of the industry, best guess now is that the big carriers' loss will be the smaller lines' gain.

Total estimated service pay bill for fiscal 1955 is \$36 million. There is talk of a rate in the neighborhood of 39¢ per ton-mile as compared, for example, to the 45¢ rate now paid to six of the carriers. For United a 10% rate cut could mean \$1 million less mail revenue annually, for AA it could mean a \$900,000 cut, and for TWA a half-million dollars.

Equalized mileage

The situation grew out of the PO's decision late last year to ship mail via carriers with the lowest rate. This eventually developed to the point where CAB, effective April 1, opened the mail rates of all domestic trunks, thereby nullifying the PO's plan until a new rate structure is devised.

Other complicating factors are now involved. In addition to equalizing rates, there is the PO-inspired problem of equalizing mileage, which means the PO would pay a carrier on the basis of the shortest mileage between a pair of points, even though such mileage represents the route of another line.

• • •

CAB Staff Would Allow Only Two Alaska Lines

A CAB examiner's recommendation for a three-carrier network of routes between the U. S. and Alaska was opposed this month by CAB's Bureau of Air Operations which claimed the present four-carrier network should be reduced to two lines—Pan American and Pacific Northern.

Arnold Berkeley, Bureau Counsel, said the staff proposal, which would drop Alaska Airlines and Northwest Airlines from the States-Alaska market, would "permit substantial savings in subsidy mail pay."

CAB Chief Examiner Francis W. Brown had recommended that Pan American, PNA, and Northwest be kept in the market and that PNA and Alaska Airlines work out a merger deal.

Brown would leave PAA as the Seattle-Fairbanks operator and keep PNA and Northwest in competition between Seattle and Anchorage.

Berkeley filed a list of 27 exceptions to Brown's report. He took particular exception to Brown's recommendation that NWA's Seattle-Anchorage certificate be renewed if its Orient route is continued. "The Examiner erred in this regard," he said, "because there is neither an operational nor a cost integration of this carrier's international and States-Alaska services."

Next step in the case will be oral argument before the Board scheduled for September.

As of now . . .

A major route proceeding involving new service between Boston, New York, Washington, and Miami has been activated by CAB. It will take about two years to complete and now involves 11 companies and 17 new route applications. It is known as the **Atlantic Seaboard Service Case** and is the fourth major route case started by CAB in the past two years.

The first of these cases, the **New York-Chicago Case**, is now in the hands of CAB Examiner William F. Cusick, who is preparing a recommendation to the Board. A decision late this year by CAB is possible.

Second is the **Denver Service Case** in which hearings were completed this month but which is not likely for final decision for about six months.

The third, and largest, is the **Additional Southwest-Northeast Service Case**,

in which hearings begin next month and which is not likely for final decision before next spring.

A major re-shaping of the domestic airline route map is inherent in the four cases if CAB so elects.

Recent CAB Decisions

Ozark Airlines controversial switch in airports at Davenport-Moline last April, ordered set for hearings on protests of Illinois cities.

Air Services, Inc., non-scheduled airline letter of registration cancelled for failure to operate since "on or about January 6, 1954."

North American Airlines again refused permission to cross-examine present and former CAB staff officials on confidential Board matters.

Braniff Airways' proposed family plan tariff for Saturdays and Sundays suspended through November 17, pending investigation.

Iberia, Spanish airline, granted amended foreign air carrier permit for Madrid-New York operations via Lisbon and the Azores.

CAB Miscellany

American Airlines asked CAB not to inject itself in the strike area by any action on airline requests for emergency exemptions to serve AA points during strike.

Eastern Air Lines reports agreement with former Colonial president Sigmund Janas has been cancelled; **National Airlines** says move raises more questions of EAL control of Colonial and should be investigated.

Delta-C&S Air Lines wants CAB action by August 20 on proposal to increase all fares to next nearest dollar figure.

CAB Calendar

Sept. 2—Oral argument, Continental-Pioneer Merger Case. Washington, D. C. Docket 6457 et al.

Sept. 8—Hearing, Air Freight Renewal Case (east-west carriers). Washington, D. C. Docket 4770 et al.

Sept. 8—Hearing, Additional Southwest-Northeast Service Case. Washington, D. C. Docket 2355 et al.

Sept. 8—Hearing, Southwest Airways Renewal Case (airline parties). Washington, D. C. Docket 6503 et al.

Sept. 9—Oral argument, Newport, Vt. Service Case. Washington, D. C. Docket 6207.

Sept. 16—Oral argument, Braniff-TWA Interchange (Texas-California). Washington, D. C. Docket 1102 et al.

Sept. 17—Prehearing conference, Atlantic Seaboard Service Case. Washington, D. C. Docket 3051 et al.

Examiners' Reports

Examiner **Barron Fredericks** recommended permanency for Braniff Airways' local service-type route 106 between Chicago and Sioux City; also, lifting of usual local service restrictions.

Mass Production Transistors



The growing of a crystal is watched by G-E design engineer William Engeler . . .



. . . and here's the result—a 1/4 lb. ingot to make thousands of tiny bars (inset) . . .



. . . and a bar with leads attached becomes a transistor. Sealed cap will be added.

THE promise of electronic transistors that will sell at prices competitive with vacuum tubes has moved nearer to fulfillment with the announcement by the General Electric Co. that it is now tooling for mass production.

G-E Electronics Division's vice president and general manager, Dr. W. R. G. Baker, said that wide-scale sampling of the industry from a pilot production plant now in operation at Syracuse, N. Y., will probably begin late this year. Mass output—running into many millions of transistors a year—will start within the next two years, he added.

Timing of the program, according to the G-E official, now hinges only on the speed of the electronics industry in designing circuits using the new extremely high frequency semi-conductors.

The entire production plan is built around the rate-grown process of mass producing transistor elements, an invention of G-E physicist Dr. R. N. Hall at the company's Schenectady research laboratory. This method, Dr. Baker said, appears to be the only technical process which shows any promise of low-cost, high-quality transistor output.

Dr. Hall found that it was possible to produce as many as several thousand elements at a time from the germanium refining process itself. By introducing such special impurities as gallium and antimony, and by varying the heat control during the crystal-growing process, as many as 100 wafer-thin layers of specially treated germanium are formed in a six-inch ingot.

Next step is to dice the ingot into bars, with each bar only several thousandths of an inch long with a layer through the center that does the work of a vacuum tube grid. Sections of transistor bar on either side of the layer serve as the cathode and plate of a tube.

At present, G-E is fabricating a few hundred finished transistors a week for engineering and military evaluation. Transistor ingots are being produced at the rate of about one every 10 days and, although it takes only two hours to process a single ingot, G-E has found that the yield of transistor elements for one ingot will keep its pilot line supplied for the 10-day stretch.

Main area of current G-E tooling and mechanization is in the fabrication process where leads are attached to transistor bars. Fabricated transistors in the triode design will result in a usable gain up to 15 megacycles, Dr. Baker said, and tetrodes will provide a gain up to 150 mc.

People

Manufacturing

Luther Harris and **Alan H. Blair**, named gen. mgr. and sales mgr., respectively, of the Aircraft Service Division of Lear, Inc. **Robert Boyer**, formerly aviation sales mgr. of Bendix Scintilla Magneto Division, now Lear's LearCar Div. military sales mgr.



Harris



Boyer

Sir Reginald Verdon Smith, joint managing director of The Bristol Aeroplane Co., appointed board chairman of MacDonald Brothers Aircraft Ltd. of Winnipeg. President of the newly acquired subsidiary is **R. J. Reynolds**, Bristol's executive v.p. **W. S. Haggett**, executive ass't to the president, will run the plant.

I. M. Laddon, former executive v.p. of Convair, elected president and chairman of the board of Langley Corp., which is planning increased activity as an aircraft subcontractor. Former president, **Henry I. Mandolf**, now v.p.-engineering and manufacturing.

Zeus Soucek, appointed gen. mgr. of General Mills Mechanical Division, replacing **Charles D. Elliot**, who died earlier this year.

John F. Walrath, named finance mgr. for the Jet Engine dept. of General Electric's Aircraft Gas Turbine Division.

Dr. Hans Erich Hollman has joined Hydro-Aire's Electronics Division engineering staff, from the Naval Air Missile Test Center at Point Mugu, Calif.

Thomas W. Shoop, formerly mgr., fuel gage project at Minneapolis-Honeywell Aero Div., named sales and advertising mgr. of Clifton Precision Products Co.

John W. Hernlund, Townsend Co.,

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appointed western aircraft sales mgr., from gen. mgr. of Cherry Rivet Div.

Max S. Simpson, formerly controller of Curtiss-Wright's Electronics Div., named ass't controller of Chance Vought Aircraft. **Floyd E. Peavler** was named internal audit supervisor.

Albert W. Cook, chief project engineer, **Donald G. Smellie**, head of research and development section, and **Charles F. Luginbill**, in charge of testing activities and laboratory operations, are recent appointments in Good-year Aircraft Corp.'s wheel and brake development dept.



Krause



Graham

Dr. Ernest H. Krause, former associate director of research at the Naval Research Laboratory in Washington, named head of Lockheed's Missile Systems Division research laboratories.

E. D. Burke, named director of advertising and public relations, and **Ken Frogley**, named public relations mgr. for The Garret Corp.

Irving L. Jones, Jr., former check

pitot and instructor for PAA, is now mgr. of customer service for Aerodex, Inc.

James A. Cole, assigned as technical specialist in the Chicago extrusion product office of Kaiser Aluminum and Chemical Sales, Inc.

Airlines

Josef B. Kapelner, named east coast district commercial mgr. for EL AL Israel Airlines, from commercial mgr. in Zurich.

Ralph H. Robertson, appointed mgr. of revenue accounting for United Air Lines in Chicago, replacing **A. K. Barrows**, resigned. **K. S. Hankland** succeeds Robertson as regional mgr. of accounting in San Francisco.

M. V. J. Stott, appointed supt. of station service for Trans World Airlines' western region.

Oda Worthy, named chief inspector for Pioneer Air Lines in Dallas, replacing **Roy R. Jones**, who has joined Temco Manufacturing Co.

Harold L. Graham, Jr., has moved up from exec. v.p. to president of Resort Airlines, succeeding **Walter Sternberg**, who will handle RES sales development as a consultant.

Government

David D. Thomas, appointed deputy director, Office of Federal Airways, succeeding **Joseph Tippetts**, who moved up to director.



★ **Humphrey W. Toomey**, PAA. V.p. in charge of operations in Brazil, Uruguay, and Argentina, Rio de Janeiro.

★ **James Crique**, PAA. Mechanic, Ciudad Trujillo.

★ **Gerald E. Lauver**, PAA. Warranty claims coordinator, Miami.

★ **Ralph O. Norsworthy**, PAA. Foreman, Miami.

★ **Herbert J. Linden**, PAA. Dispatcher, Miami.

★ **Delmar C. Flynn**, PAA. Link instructor, Miami.

★ **Ray H. Sullinger**, PAA. Production control coordinator, Miami.

★ **Malcolm H. Patterson**, PAA. Assistant foreman, Miami.

★ **Drury D. Dixon**, PAA. Master mechanic, Miami.

★ **V. Thomas**, AA. Supervisor, New York.

★ **V. E. Hart**, AA. Maintenance foreman, Fort Worth.

★ **C. C. Stiller**, AA. Maintenance foreman, Fort Worth.

★ **Harold B. Allen**, TWA. Foreman, Kansas City.

★ **Edward C. Peet**, TWA. Director, domestic accounting, Kansas City.

★ **Clifford G. Banbury**, TWA. Foreman, Los Angeles.

★ **George C. Leary**, TWA. Foreman, Los Angeles.

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RIGHT TO THE TOP—The Beechcraft T-34 Mentor shows in this unusual performance-photo one of the reasons why it has won *every evaluation* contest in which it has participated since the flight of the first prototype on December 2, 1948.

Developed by Beech Aircraft as a private venture, the Beechcraft T-34 has been adopted as the official trainer for the U. S. Air Force, the U. S. Navy, and the air services of Canada, Chile, Colombia, El Salvador, and Japan.

Beech Aircraft Corporation, Wichita, Kansas, U.S.A.

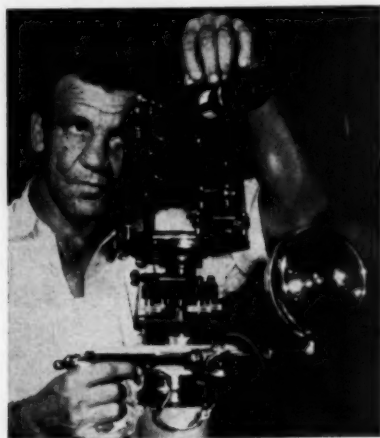
Beech Builds: USAF T-34 • USNavy T-34 • USArmy L-23 • USAF C-45 • Model E35 Bonanza • Model B50 Twin-Bonanza • Super 18 Executive Transport
AUGUST 30, 1954

Maintenance Bulletin Board

Auto Spotlight Aids In Jig Alignment

Faster and more economical alignment of jigs and fixtures during their construction for aircraft production is the result of a simple shop fixture adopted by Chance Vought. It consists of an ordinary steerable automobile spotlight attached to a surveyor's transit.

In the past, with ordinary factory illumination, it was difficult for the transit operator to read the minute



measurements on the scale. The company experimented with theatrical lights, floodlights, and photographic slide projectors, but found that an additional man was needed to hold the light while another adjusted it on the jig in line with the transitman's motions.

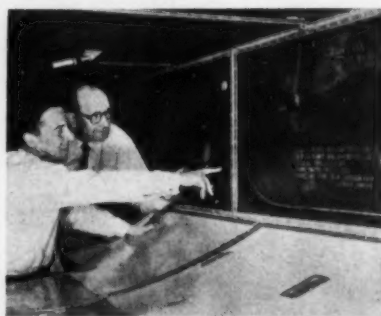
The auto spotlight, an idea of industrial engineer Philip P. Hathaway, dispenses with the extra light man. The only other equipment needed for the installation is a small transformer mounted on the transit base to convert plant power to the six-volt rating of the light.

Zippered Linings Seal Connie Baggage Areas

The long-standing problem of maintaining an air-tight seal in aircraft underfloor baggage areas is getting relief in Lockheed's Super Constellations with the use of new zippered compartment linings. In the latest 1049C's, 33 individual access panels in two belly compartments are fastened by pressure sealing zippers developed by B. F. Goodrich.

Ever since sealing became a re-

quirement to retain CO₂ fire extinguisher agent within belly compartments and prevent leakage into crew



and passenger areas, roll after roll of special sealing tape has customarily been used to seal metal joints. Slipshod installations that would still allow leakage and possible taping over fire detectors are only a few of the problems that have prevailed.

The new Goodrich liners are fabricated from fiberglass combined with a special rubber compound. The pressure-sealing zipper features two overlapping rubber lips that seal tight against pressures from zero up to the structural strength of the zipper itself.

"Toothpaste" Tube In Sealing Jobs

Bell Aircraft has settled on a common household item, the collapsible "toothpaste" tube, as the answer to the



Inspection Aid

Inspection of precision engine parts at Pratt & Whitney Aircraft gets an assist from a new binocular-type magnifier, the Magni-Focuser, which frees both hands for part handling and can be worn with or without regular eye-glasses. The Magni-Focuser is produced by Edroy Products Co., 480 Lexington Ave., New York 17, N. Y.

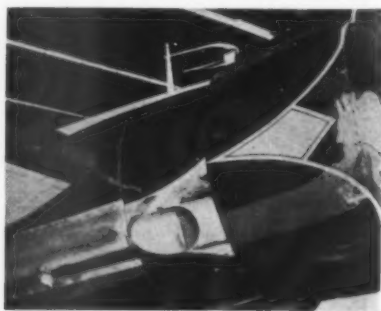
problem of applying plastic compounds and rubber cements to seal aircraft hatches, tank covers, and overlapping surfaces.

The compounds formerly were applied with a variety of spatulas, brushes, or caulking guns—all difficult to clean and requiring a good deal of maintenance. The compounds themselves were unwieldy and hard to remove from skin, clothing, or the surface being sealed.

At Bell the compounds are loaded into small tubes for direct on-the-job application. The result, the company says, is a cleaner sealing job, virtual elimination of clean-up operations caused by mis-application, and actual dollar savings from reduced waste and spoilage of compounds.

New Lodestar Heater And Exhaust Manifold

Mallard Industries, Inc., located at Bridgeport Municipal Airport in Stratford, Conn., has completed flight testing and received CAA approval of a new exhaust manifold and heater system for the Lockheed Lodestar. The



design does away with the standard ball-joint exhaust collector ring and intensifier tube heater and has been installed in a Lodestar operated by Kollsman Instrument Corp.

Past problems with the Lodestar installation led Kollsman's chief pilot, Al Zotack, to basic planning for the new systems. Wear of exhaust system ball joints, shortage of replacement parts, and the potential danger of introducing carbon monoxide into the cabin or cockpit with the old heater were all factors.

In the new design Mallard uses a relatively inexpensive and readily available sleeve-type collector ring with a short stack. The old tailpipe and intensifier tube are gone and a combustion heater complete with controls and ground blower has taken their place.

AMERICAN AVIATION

New Products

Heli-Coil Develops New Screw Locking Insert

Heli-Coil Corp. has developed a new screw locking insert—an adaption of its standard Heli-Coil thread insert—which it says will eliminate the need for lock washers, safety wire, or lock nuts in many capscrew installations. Called the grip-end insert, the product is already in use by one major airframe manufacturer for cowl fastener installation and is being considered by others for a variety of aircraft assemblies.

Three basic functions are performed by the new insert:

- Automatic vibration-proof screw locking, dispensing with need for lock washers, wires, or nuts.

- Serves as a high-strength thread in the same manner as standard Heli-Coil inserts.

- Is self-locking into the parent material without special pins, rings, or other staking devices.

Design of the "grip-end" provides a constricting area in the bottom coil



which is expanded by the screw and provides a gripping action to resist loosening due to vibration. Once locked, the screw may be readily broken loose by applying about the same torque as used in initial assembly.

Among other advantages seen are weight and cost savings resulting from use of shorter screws, and elimination of the tendency of some lock washers to score finished surfaces or rupture plating or other protective coatings. The manufacturer says that in many instances the new inserts will permit use of ordinary cap screws instead of studs which usually require careful tapping and interference fits.

Although current production is confined to sizes 10-32 and ¼-28 in two standard lengths, other popular sizes are now being developed, the company announced. Address: Heli-Coil Corp., Dept. AAP, Danbury, Conn.

Oxygen Mask

New nasal oxygen mask, molded from Tenite butyrate plastic to conform to normal facial features, can be readily cleansed for re-use with mild soap and warm water.

The mask is designed to rest lightly on the face, and is held in place by an adjustable rubber headband. An attached Latex bag receives oxygen from the airplane supply through a



tube connection at the bottom, and an adjustable disk valve covering the mask nose vents permits variation of the oxygen concentration to suit the user's requirements. Address: Puritan Compressed Gas Corp., Dept. AAP, 2012 Grand Ave., Kansas City 8, Mo.

Vibration Analyzer

For balancing rotating parts at speeds up to 5000 rpm, this new electronic vibration analyzer weighs only 24 pounds and can be carried to a machine tool or other piece of equipment to be checked for excessive vibration.

Actual balancing requires a short four-step procedure with the aid of a stroboscopic lamp having a range up to



5000 flashes per minute. Analysis is provided through electronic frequency and displacement circuits which display data on a series of panel meters at a reported accuracy of within 10%. Address: International Research & Development Corp., Dept. AAP, 168 E. Hosack St., Columbus 7, Ohio.

Solderless Disconnect

A new gang-disconnect panel designed by Burndy Engineering Corp. for bulkhead installations in pressurized aircraft completely eliminates the necessity for soldered connections.

In their place, Burndy has developed the Unilok disconnect, an assembly made up of three major components—a receptacle, plug, and socket. A plastic arc-resistant panel in the receptacle serves as the pressure panel, and double-ended contact pins molded into the plastic are numbered at both ends to simplify circuit installation and testing.

Main feature of the Unilok is the "Hysocket" compression socket which is crimped to the wire conductor on one

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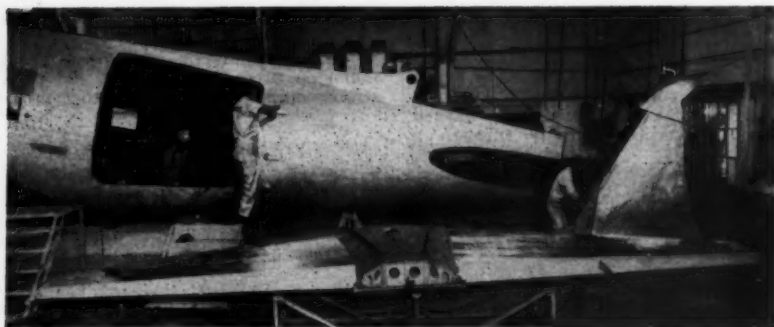
Compared with the most widely used prewar twin-engine transports, the Martin 202 carries almost twice the payload, cruises at speeds up to 100 miles an hour faster and climbs at a nearly 50% greater rate, but operates from the same airports. The Martin 202 was the first postwar transport to be certified under the terms of

Part O4B of the United States Civil Aeronautics Regulations, established to assure the highest standard of safety.

Due to an unusual situation, a fleet of nine aircraft, together with spare parts, are available for sale, lease, lease-purchase or trade, singly or as a fleet. Detailed specifications on request.



Executive DC-3s



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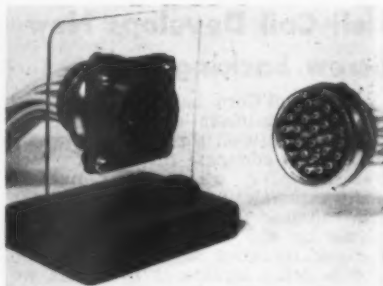
The planes that are being converted are part of a fleet of 83 planes that were in scheduled airline service in China and were taken out just ahead of the Red invasion. TEMCO engineers inspected 12 of these planes in California for the quality of their airframes and purchased

them. They were flown to TEMCO's Greenville, Texas, plant where the remanufacture is accomplished.

The photographs above give some indication of how extensive and complete this remanufacture is . . . for complete details write to:



end with standard Burndy compression tooling. The opposite end, which is inserted into the plug, employs an internal contact spring and spring-supported



locking latch to guarantee a secure connection.

Added protection against mis-installation is provided by an inspection hole to check for full insertion of the socket into the plug and an external shoulder to positively locate the "Hy-socket" in the plug. Once inserted, the socket spring latch prevents accidental removal by any force up to 50 lbs., yet for maintenance purposes the latch can be easily depressed for quick removal. Address: **Burndy Engineering Co., Inc.**, Dept. AAP, Norwalk, Conn.

Harness Wrapper

New Model E-2 taping gun speeds up installation of plastic electrical tape from two to ten times over past methods, the manufacturer states. Designed for use with 3/8"-wide, No. 33 "Scotch" plastic tape, the new dispenser weighs



less than 20 ounces complete with a 36-yard tape roll inserted.

Special feature of the gun is a 10 1/2"-long curved tip for threading the tape around wires on a layout board or in otherwise inaccessible areas. Once installed, a thumb button is pressed to cut the tape, completing the wrapping operation in one easy motion. Address: **Minnesota Mining and Manufacturing Co.**, Dept. AAP, 900 Fauquier St., St. Paul 6, Minn.

Wind Sensor

For measuring the force and direction of wind in aircraft research, a new electrical sensing instrument combines a 2-inch diameter hollow metal ball with the necessary strain gages, am-

plifier circuitry, and recording instrumentation to provide instantaneous indication of changes of both wind magnitude and direction.

The pick-up unit is basically a cylindrical cantilever beam on which two



separate Wheatstone bridge circuits, consisting of SR-4 resistance strain gages, are arranged to measure strains caused by wind forces in two directions at right angles to each other. Address: Baldwin-Lima-Hamilton Corp., Dept. AAP, Philadelphia 42, Pa.

Microwave Test Unit

For laboratory and production line testing as well as field maintenance of X-Band radar, this new test instrument is designed for operation by personnel having only a minimum of training.

Utilizing modular construction, with each test section mounted on separate plug-in sub-chassis, the new tester weighs 45 pounds and measures 17" wide, 10½" high, and 13" deep.

Test functions accommodated are: power measurement, observation of transmitter spectra distribution, frequency measurement, and generation of artificial test signals. Provision is also

included for analysis of bandwidth characteristics, and a self-contained square



wave generator aids in making standard wave measurements. Address: Kearfott Co., Inc., Dept. AAP, 14844 Oxnard St., Van Nys, Calif.

Aircraft Hoist

New electric motor-driven aircraft rescue or cargo hoist weighs about 25 pounds exclusive of cable and will raise or lower a normal load of 800 pounds at a rate of 50 feet per minute, the manufacturer says. Maximum operating load is 1200 pounds and top static load is 3000 pounds.

Hoist is powered by a 1½-hp, 26-volt, 8500-rpm motor driving through a 3-stage reduction gearing of 193:1



ratio. Equipment includes a magnetic motor brake, gear reduction, cable drum, and level winding mechanism. A normal hoisting reel uses 150 feet of 3/16" cable which, in operation, is evenly and compactly arranged in six layers on the drum. Address: Western Gear Works, Dept. AAP, Lynwood, Calif.

The pause that Sequences.



When a measured delay is required in sequencing an electronic control system, Tarrytron thermal time delay offers a practical and economical solution.

Qualified to MIL-R-6106 by Inland Testing Laboratories and thoroughly flight tested by practically everything that flies, Tarrytron provides a reliable, small, light weight, hermetically sealed timer.

It weighs 4½ ounces and measures 2½" x 1½" x 1½" displacing only 4.75 cubic inches. Time Delay Range settings range from ½ to 120 seconds and can be calibrated to 28 volts DC or 115 Volts AC.

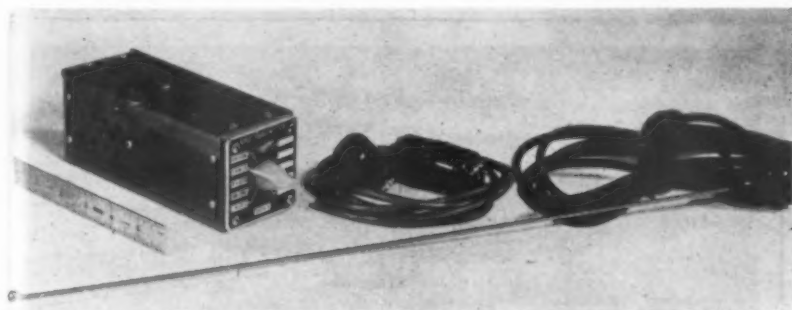
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VHF Transmitter

A new 10-channel VHF transmitter for private aircraft that weighs only eight ounces and sells for \$79.50 is being marketed by Air Associates, Inc. Identified as the Aerotrol Model 200, it can be quickly installed in any standard 2¼" mounting using an antenna and

installation kit available for an additional \$10.50.

Basic transmitter price includes five crystals for emergency, ground control, radio, tower, and unicom operations. Provision is included, however, for addition of five other channels if desired. Address: Air Associates, Inc., Dept. AAP, Teterboro, N. J.

INTERNATIONAL AVIATION

Edited by Anthony Vandyk



INTERCOM

THE success of the car ferry operations of Silver City Airways between England and continental Europe is reflected in the recent inauguration of an airport built by the airline. The only available government-owned airfield (Lympne, where international car ferry operations were started by Silver City six years ago) has been outgrown. The new airport known as Ferryfield, has two concrete runways, a 30,000-square-foot terminal building, and radar aids. It was built in less than six months at a cost of about \$700,000.

Silver City Airways' traffic growth has been accompanied by a steady reduction in fares. In 1948 the roundtrip fare for a small car and two passengers without insurance was \$151.20. This year the equivalent fare is \$60.20 insurance included. In the first full season's operation, 1949, using three Bristol 170 Freighters hired from the manufacturer, 2600 cars, 100 motorcycles, and 7900 passengers were carried.

This year, with a company-owned fleet of 15 Bristol 170 Freighters and Super-freighters, Silver City is carrying record traffic and will certainly exceed last year's total of 39,000 vehicles (out of a total of 175,000 vehicles transported between England and continental Europe by sea and air) and 96,000 passengers.

Operating a car ferry is not easy, since usually there are very pronounced seasonal peaks. Many routes where there seems to be a big potential are disappointing in practice. Several years ago Aerovias "Q" started carrying cars between Florida and Cuba experimentally but did not find enough interest to warrant putting the operation on a permanent basis. Silver City has long sought to duplicate this Florida-Cuba operation but, being a British company, it cannot actually fly the service itself.

It feels that the Bristol 170, with a capacity of three cars, might succeed where the Conquest operated by the Cuban carriers failed. Silver City, incidentally, plans to replace its fixed-wing car carriers with helicopters, and is interested in modifying the Fairey Rotodyne for this purpose.

Airwork Orders Two DC-6A's

AIRWORK, LTD, British independent, has ordered two Douglas DC-6A Liftmasters for its trans-Atlantic all-cargo services. Delivery is expected in January or February 1956. British government approval was given for the dollar purchase since the aircraft will be used for dollar-earning work.

Meanwhile, Airwork plans to start its freight services from London to Montreal and New York with Handley-Page Hermes early next year. Eventually, it expects to use Bristol Britannias on the trans-Atlantic route. Initially, Airwork will not operate more than two flights a week.

There will probably be cooperation between Airwork and BOAC to increase cargo business overall. The independent feels that the two services can be complementary—bulk shipments being transported by Airwork and other items by BOAC. In effect, urgent freight at short notice would be BOAC's prerogative while Airwork would specialize in pre-planned bulk shipment.

Airwork, now backed by the Furness-Withy and Blue Star shipping companies, will almost certainly use the Furness office in New York as the base for its master agent in the U.S. Its sales drive on both sides of the Atlantic will be directed toward the industries making commodities that travel more cheaply by air (furs, for example) and finding ways of overcoming customs and other terminal delays.

No Jets Yet for KLM, Says New President

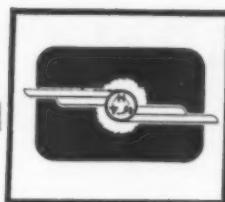
There will be another round of piston-engine transports before the jet era arrives, I. A. Aler, president of KLM, told *AMERICAN AVIATION* in Washington earlier this month. In line with this thinking, he confirmed that the Dutch flag carrier has ordered three Lockheed L-1049G Super Constellations (with an option on a fourth), bringing to 16 the number of Super Connies for which KLM has placed firm orders.

In advocating prudence in switching to jet aircraft, Aler considers that the airline industry should be extremely careful not to lose its good reputation. He believes that new types must be proven before they enter airline service. Aler does not plan to sell any more of KLM's trunkline aircraft (another Convair 240 was sold to Swissair a few weeks ago).

Aler said that KLM would buy two of the initial series (probably 24 aircraft) of the Dart-powered Fokker F.27 "DC-3 replacement." He considers that at present helicopters are too expensive to operate. Aler reports that KLM will stay in the back "even with present fare levels," but he points out that throughout the industry "the profit margin is coming to a dangerous point."



Australia's Jindivik pilotless target aircraft has now passed the experimental manufacturing stage and is in quantity production at the government aircraft factory where it was designed and developed. Intended originally to function only as a harmless "guided" target to be shot at by rockets and other missiles, the subsonic Jindivik is being used to test high-speed remote-control mechanisms.



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INTERNATIONAL AVIATION

MANUFACTURING

FRANCE: Breguet is modifying its two 760 Vultur naval aircraft prototypes which were originally each powered by an Armstrong-Siddeley Mamba and a Rolls-Royce Nene. The Nene has been removed from one of the prototypes to make possible a three- (instead of two-) man crew. The other is being converted for test work on boundary layer control . . . Morane Saulnier 760 four-place jet liaison aircraft made its first flight on July 29. Derived from the 755 Fleuret, the 760 is 13 inches longer and has a range of 870 miles flying at 310 mph at 20,000 ft. . . . SIPA 300 two-place jet trainer is due to fly this month . . . Farman Monitor III piston-engine trainer made its first flight on July 21 . . . SFECMAS 1402 Gerfault experimental delta interceptor has made 30 flights since it started its test program in January.

BRITAIN: Flight testing of the de Havilland Gyron axial jet is taking place in one of the Short SA4 bomber prototypes . . . Rolls Royce Avon RA28 is rated at 10,000 lbs. static thrust . . . Napier Oryx gas generator develops 750 hp. . . . William Jessop & Sons is installing titanium smelting facilities at its Sheffield plant for pure and alloy production . . . First Gloster Javeline all-weather fighters are starting to come off the production line and the RAF hopes to form a squadron by early 1955. Javelin reportedly carries four 30-mm cannon . . . Short Seamew antisub plane now has fixed slats added about mid-span and a stabilizer/fin filler in the form of a hollow vent to improve control at around-the-stall condition.

NETHERLANDS: Fokker Aircraft Co. reports a profit of \$1,060,000 for 1953. Chief activity is preparation for the production of 460 license-built Hawker Hunters and a small quantity of S.14 trainers.

AIRLINES

BRITAIN: A suggestion that Britain should follow the U.S. example of excluding shipping companies by law from entering air transport has come from Peter G. Masefield, chief executive of British European Airways . . . Lord Rotherwick, chairman of Clan Line Steamers, a shipping company with aviation interests (notably, Hunting-Clan Air Transport), has described BEA and BOAC as "chosen instruments which can and do compete on an unfair basis," adding that "practically all the high-density main trade, and therefore profitable, routes are reserved to them so that shipping companies are unable to proceed with the logical development of their shipping services with complementary air services." . . . BOAC is reported to be paying about \$5 million for the six Stratocruisers and spares it is buying from United Air Lines . . . Jersey Airlines has taken delivery of a de Havilland Heron and is planning to order more.

IRELAND: Aer Lingus incurred a net loss of \$175,456 for its fiscal year ended March 31, 1954, against a loss of \$240,010 for the previous year. As in 1952-53 the Irish flag carrier is not using its statutory right to call on its two shareholders, Aer Rianta and British European Airways, to make good this deficit, but it has applied to them for a loan.

SPAIN: Iberia introduced Super Constellation equipment on its routes to Cuba and South America. Substitution of

Super Connies for DC-4's on the Madrid-Buenos Aires run enabled the intermediate stop at Natal, Brazil, to be eliminated. The aircraft fly non-stop from Dakar to Rio de Janeiro.

NEW ZEALAND: Tasman Empire Airways is offering four of its five Short Solent 4 flying-boats for sale at \$226,000 each. The carrier has substituted DC-6's for the Solents on its trunk routes between New Zealand and Australia. The fifth Solent will be retained by TEA for the operation of its regular services to the island groups to the north of New Zealand and to Tahiti. These operations will be based on Suva, Fiji, where the airline will have a staff of about 12. Servicing will be performed by the Royal New Zealand Air Force, which has a squadron of Sandringhams based there.

GERMANY: Deutsche Lufthansa is likely to increase its Super Constellation order from four to six. The German flag carrier has ordered two Saab Safirs for training.

SCANDINAVIA: Scandinavian Airlines System will use Winnipeg instead of Edmonton as the Canadian intermediate on its "polar" route to the U.S. west coast which it plans to open on November 15. SAS is building three radio stations in Canada in connection with the route.

NETHERLANDS: KLM has opened a weekly experimental service between Karachi, Pakistan, and Kabul, Afghanistan, via Kandahar. If the service is successful it will be put on a scheduled basis at the beginning of 1955. DC-3 equipment is used with accommodations for eight passengers (the remainder of the space being kept for freight). In the first six months of 1954 KLM carried 18% more passengers and 20% more freight than in the like period of 1953.



Latest Spanish military light transport is the AISA AVD-12 (right) designed by E. Dewoitine, designer of many well-known French aircraft. Powered by a 150-hp ENMASE Tigre engine, it met a specification which required a top speed of not less than 110 mph, a stalling speed of not more than 37 mph, endurance of 2½ hours, and a ceiling of 15,000 ft.

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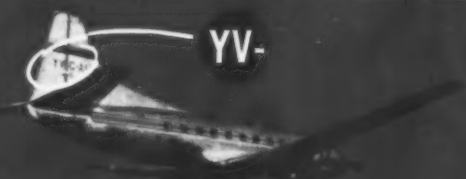
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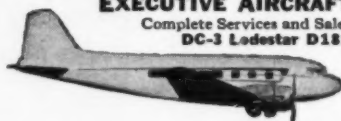
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Bonanzas

New, Demonstrators,
Used, Trade ins



EN ROUTE...

WAYNE W. PARRISH

Whoever heard of a hotel without a Roman bath?

Mr. Charles Rochester, Pres.
Hotel Lexington
New York City

Dear Charlie:

For more years than I care to remember I have been given shelter and sustenance in your hostelry, and I must say I've never had any cause to complain. Until recently, that is.

Charlie, I think you've been holding out on me. In all these years you've never given me a room with a sunken Roman bath.

Now don't tell me you don't have any Roman baths. You *must* have some. Doesn't *every* hotel? All I want is for the guy who takes up my bag to unlock whatever door is necessary so I can use my Roman bath. Let's stop horsing around. I've been a good paying customer. I deserve something better than a standard porcelain bathtub.

What got me to thinking that you've been holding out on me was when I was staying at the Ritz Hotel in Barcelona over in Spain last May. Now Charlie, there's a real hotel.

My wife and I were shown to our room and as I walked by the entrance to the bathroom I made the customary side glance to see that it was a complete affair. Complete it was, Charlie. It gave me such a start that I stopped dead in my tracks and took a good look.

Yes siree, here was a sunken Roman bath, all nicely finished in mosaic tile with nice chrome railings leading down the three steps into what looked like a swimming pool. All this on the fifth floor, mind you. It was a beaut.

From now on I don't want to stay in any hotel that can't provide me with one of these baths. Six feet long, about 30 inches below the floor level, at least three feet wide, and big enough for four people.

Baths can be fun

Get the idea, Charlie? Invite friends in for a bath. Make fun out of the dull chore of getting yourself clean. Take turns scrubbing each other's back. Get to know your neighbors better. Take the snobbishness out of hotel bathing. (Now there's a crusade for you!) Use bubble bath stuff and make a game out of who you bump into. Win friends with Roman baths, that's what I say.

Yep, the Ritz in Barcelona is a swell layout, Charlie. The bathroom itself was as big as one of your Lexington bedrooms, but it was the sunken bath

that rated with me. What concerns me is that the price for all this was just what I have been paying at your inn, so I just figure you've been holding out on me. Just put this down on Miss Emily Mandeville's notepad, that the next time I ask for a reservation, assign me one of those Roman baths and don't give me any stuff about not having any. Gracious me, who ever heard of a hotel without sunken baths?

Another thing, Charlie. When are you going to start installing bidets at the Lexington? That's the finest and most versatile plumbing fixture ever invented and your patrons deserve only the best.

Two new discoveries

What brings this up, Charlie, is that I discovered two new types of bidets on this spring trip. Of course every hotel we stayed in on the Continent was equipped, but I found these two new types quite ingenious.

One was in the Hospel El Cid, a government-owned tourist roadside hotel just east of Burgos in Spain. It was a 3-in-1 deal which looked at first glance like an ordinary shower bath. But to get into the shower you had to step over a tiled ledge rising about 18 inches off the floor. Inset on the inside of this ledge was a plumbing fixture of the kind found in the one type of bidet which Americans experiment with and which always sprays them with water.



The 3-in-1 combination was shower, foot bath, and bidet, all in an area of three by three feet. There was one master lever controlling the water for whatever purpose desired—shower, bidet, or bath. Then you turned on the hot and cold water for the proper desired mixture. Compact, well-designed, a compliment to Spanish ingenuity.

The other discovery was in the small town of Espalon in south central France where we stayed at the Hotel Moderne Berthier, one of those typically ancient family-run hotels featuring in the dining room some of the finest *pate de fois gras* I have ever tasted.

In our bathroom was what looked like an ordinary water closet. But you lifted the top lid and here was a porcelain basin with a hole and rubber stopper in the bottom for drainage. Hot and cold water pipes brought the water in along the sides. If not using the bidet, then you lifted the basin and, presto, here was an ordinary toilet seat which, in turn could be lifted. Four layers, all very compact, and space-saving—a 2-in-1 deal. The manufacturer calls it *le bidet closet*, and so it is.

Since first writing about the bidet as a masterpiece of French plumbing year before last, I've had comments from just about every country in the world. I discovered that Americans were largely unaware of the fact that every large U. S. plumbing fixture firm makes bidets as standard items. Crane and Standard, for example, turn out several types in all colors. Unfortunately the bidet has had a somewhat sinful connotation, though Lord knows why, because the American shower bath is a poor way of keeping really clean. There ought to be a bidet in every household.

Un dry

By the way, on the subject of hotels, when you want a really dry American martini in Spain (the European variety is repulsively sweet) you call for "a dry." Don't even have to use the word martini. Every bar seems to have a bottle of Gordon's gin for English and American patrons, but the Spanish have a local gin called Malaga, made in the city of the same name, with a label which is a deadring copy of the Gordon's label. Beware of the Malaga stuff, it's pretty bad. Since Whiskey is very expensive in Spain, "un dry" is the wisest aperitif.

Ah, well, what I really want the next time I come up to the Lexington is a Roman bath. Remember that. Six feet long, 30 inches below the floor, three feet wide. And lots of bubble bath stuff.

Adios,

W.W.P.

AMERICAN AVIATION



The Eland, one of the most powerful of the South African antelopes, moves off at high speed when danger threatens.

adding speed smoothly

The Napier Eland is a propeller-turbine aero-engine for use with a single-rotation propeller. It has been designed and developed by a firm with a long list of outstanding engines to their credit — and it shows its pedigree in many ways: excellent compressor characteristics, for instance. These give the Eland really smooth rapid surge-free acceleration.

CHECK THESE OTHER IMPORTANT ELAND FEATURES!

- High aerodynamic efficiency — 3,000 e.h.p. in a maximum diameter of 36 inches.
- Low specific fuel consumption — 0.450 lb/e.h.p./hr. at 36,000 ft. 400 knots cruising.
- Easy maintenance — independent unit construction.
- No turbine overheating — mercury vapour variable datum controller.
- Automatic propeller pitch coarsening.
- Safeguard — in the event of any mechanical failure between engine and gearbox the overspeed governor continues to be driven by the engine. The oil system pumps (driven by the propeller) continue to supply oil to operate the auto-pitch coarsening.

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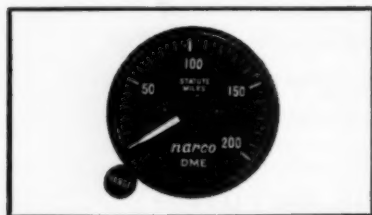
NARCO DME HAILED BY PILOTS

Distance Measuring Equipment Adds New Safety, Efficiency and Flight Ease for VFR and IFR.

Positive, continuous indication of exact position is now an everyday reality for scores of aircraft equipped with the new Narco DME. This Distance Measuring Equipment tells the pilot his exact distance from any VOR/DME or ILS/DME station.

Since the Narco DME was introduced, executive aircraft in all parts of the country have been equipped with this new electronic navigation aid and many more installations are being completed each week. Built to full airline standards, the Narco DME is also undergoing exhaustive airline evaluation with excellent results reported to date for safer and more efficient scheduled operations.

Those who are now using DME report greatly simplified VFR and IFR operations—no more cockpit calculating to estimate position; ground speed or winds aloft easily checked; ETA's on the money; holding patterns "duck-soup", and ILS approaches far simpler.



Two-Scale Reading

The Narco DME was developed under CAA/ANDB sponsorship and is the first of Narco's Sapphire line of equipment designed to the very highest electronic standards possible. It meets full CAA Type Certificate requirements for airline use and has exclusive crystal-tuning feature for positive "locked-on" tuning with no chance of off-frequency transmission or reception.

Mileage is given on the standard size, panel-mounted indicator shown above. By flipping a switch the pilot can select either the 0-200 mile scale or the 0-20 mile scale for precise close-in approach or ground speed check.

The main interrogating unit is remotely installed on a standard 1/2 ATR rack. Total equipment weighs only 32 pounds.

DME System Nears Completion

DME is the next link in the common-system of navigation agreed upon by the military and civil air space users and now being implemented by CAA.



The vertical pole above the dome-shaped VOR station is the DME antenna, now being installed at all VOR stations throughout the country and at many ILS sites to give the pilot precise information on distance to touchdown. 246 DME stations are already in operation with the entire system to be completed in less than a year, according to CAA.

Nation-wide Narco DME Service

To assure users of perfect operation of their Narco DME, Narco established a complete nation-wide service network and conducted an extensive service school even before the first DME was delivered.

Service centers with complete test equipment are now in operation at conveniently located spots. Thanks to this and the unitized construction which permits quick and simple interchange of basic elements, Narco DME users can be sure of continued, reliable use of their equipment.

Don't delay putting the DME system to work for you. See your nearest NARCO distributor for further details or write for brochure on the Narco DME to

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National Aeronautical Corp.
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Enthusiastic DME Users Report



THE CRANE COMPANY of Chicago installed Narco DME in their DC-3 after careful evaluation by their Chief Pilot Randy Mulhern (left) well-known executive pilot and former head of CAA's Airways Flight Inspection. At right is Frank Bohling, Bohling Aircraft Co., Chicago installation and service center for Narco DME.



MICHIGAN TOOL COMPANY's Lodestar has flown 75 hours now with Narco DME. Chief Pilot Paul Holst reports: "It certainly is nice to be able to give a quick, accurate answer to the old question, 'What is your present position?' Checking ground speed quickly is also a big help. We are most enthusiastic about our Narco DME."



MARION ELECTRICAL INSTRUMENT CO. Manchester, N. H. have Narco DME in their Aero Commander. "In particular we consider it a primary navigational aid on approaches to fields that are off airways or not equipped with landing systems," reports H. A. Donahue (left) Sales Manager, Aviation Division, shown with R. A. Ammon, President.

AMERICAN AVIATION

News at Deadline

Strike Truce Reached; Issue Goes to Referee

Details of a back-to-work agreement were being worked out by American Airlines and the Air Line Pilots Association at press time after a truce had been reached on the 23rd day of the pilots strike.

Parties agreed on August 22 to a proposal of National Mediation Board Member Leverett Edwards to resume service and let a neutral referee decide the controversial 8-hour issue.

American was planning to resume transcontinental non-stops on August 25, although the pilots maintained no date had been agreed upon pending settlement of the back-to-work plan.

In the truce agreement, American won the right to continue its west-bound transcontinental non-stops, pending decision by the referee, and the company's multi-million dollar suit for damages against the union was unaffected. The damage suit was scheduled for a hearing in Federal District Court, New York, on August 24, on a motion for a summary judgment against the pilots.

Johnson, Potts Named To Hoover Study Group

Earl D. Johnson, Air Transport Association president, and Ramsey D. Potts, Jr., Independent Military Air Transport Association president, have been named to serve on an advisory group to assist in a Hoover Commission study of the Military Air Transport Service and the Military Sea Transportation Service.

The group will be concerned generally with waste, inefficiency, and duplication of services and with the elimination of the government from competition with private enterprise.

AF Testing Goodyear's New Tow Target

Goodyear Aircraft Corp., Akron, O., has developed a winged tow target for the Air Force which can perform evasive maneuvers either automatically or by direct control from its towplane.

Now being tested by Wright Air Development Center, Dayton, O., the target weighs 1400 lbs., has a 25-ft. wing span, and is designed for high-speed, high-altitude aircraft gunnery practice. It can be towed at speeds greater than 500 mph, officials said.

Continental Defense Chief Asked by Cole

Rep. Sterling Cole (R., N. Y.) called for an assistant defense secretary to be responsible for continental defense, in a talk at the recent Air Force Association annual convention, Omaha, Neb. Chairman of the Joint Committee on Atomic Energy, Cole also urged that a mutual continental defense pact with Canada be established, noting that such a treaty would "represent the continental defense equivalent of NATO."

CAB Renews Ozark Local Service License

CAB renewed Ozark Airlines' local service certificate through September 30, 1958, and revised the carrier's routes substantially by adding five new cities and dropping 18.

Segments between the following pairs of terminals were named: (1) Milwaukee-St. Louis; (2) Davenport-Indianapolis; (3) Chicago-St. Louis; (4) St. Louis-Nashville; (5) St. Louis-Wichita; and (6) Kansas City-Chicago.

Nashville was the largest of the new cities added, while Memphis, Tulsa, Topeka, and Bartlesville, were among those dropped.

In same decision, CAB amended Lake Central's certificate to permit an Indianapolis-Chicago service via Bloomington, Terre Haute, and Danville. Also, Continental Air Lines was authorized to serve Bartlesville between Tulsa and Kansas City.

Trunk-line suspensions ordered were: (1) Delta-C&S at Terre Haute; (2) TWA and Quincy-Hannibal; and (3) Braniff at Jefferson City.

Avianca's Super Connies Delivered This Month

Avianca is due to receive the first of its three Lockheed Super Constellations on August 31 and the other two aircraft on September 7 and 14; respectively. They will carry 15 tourist passengers (in the tourist cabin) in addition to 44 first-class passengers. The Colombian airline's present Constellations will be converted for use on all-tourist services. Effective October 1 Avianca will offer four Super Connie and three Connie flights each week between Colombia and New York.

Jet Transport Problems On Airworthiness Slate

The structural problems of jet transports and the considerations involved in setting up a transport category for helicopters will be featured during the CAB's annual review of airworthiness regulations beginning September 13.

Five days are scheduled for fixed-wing transport discussions, with one or two days set aside for rotorcraft.

Among the structural problems are a proposal to reduce gust loads above 25,000 feet, supported by the Air Transport Association and the Aircraft Industries Association, but opposed by CAA as premature. The structural agenda also includes discussion of pressurized cabins and never-exceed speeds for jets, and loading gear for high-altitude and down-wind conditions.

Stall performance demonstration rules are due for consideration again, with ATA and AIA favoring revisions and CAA opposed. The support and opposition is the same on the suggestion that the smoke detector equipment requirement be eliminated from CAR 4b.383. The change has been argued but unenforced since 1948. New rules defining continuous and intermittent maximum icing are generally supported by all three groups. The changes spring from studies conducted by the National Advisory Committee for Aeronautics.

The definition of a transport category for helicopters will revolve around one-engine-out performance night and instrument flight characteristics, structural loading conditions, and endurance tests of major components.

First GRB-36 Flies

Convair Division of General Dynamics Corp., Fort Worth, Tex., has test flown its first production model GRB-36, a standard RB-36 modified to launch and retrieve a Republic F-84F in the Air Force's "Ficon" project. Convair has an AF contract to modify about a dozen B-36's for this mission, it is reported.

New Rolls' Jet Engine

Latest Rolls-Royce jet engine is the Soar, a small axial-flow unit which has passed a type-test at 1860 lbs. thrust. It will be shown at Farnborough. The Soar is 15 1/4 in. in diameter, 62 1/4 in. long and weighs 267 lbs.

PAA Sells Two 340's To National

National Airlines' fleet of Convair 340 aircraft was raised to 10 recently with the announced purchase of two additional 340's from Pan American World Airways. The new aircraft are slated for use on intermediate schedules over NAL's system.

Purchase price was not disclosed. NAL's original eight 340's were purchased from Convair last year for \$5,450,000, or an average of approximately \$680,000 per airplane.

Dulles, Yeager, Stapp Get AFA Awards

Secretary of State John Foster Dulles has been named by the Air Force Association as Aviation's Man of the Year "for distinguished service contributing to national security and world peace." In giving him its H. H. Arnold Award, AFA said that Dulles has given needed recognition and expression to the concept of the importance of airpower as an instrument of our national policy."

Other AFA awards:

Hoyt S. Vandenberg Memorial Trophy: to Gill Robb Wilson, editor of *Flying* "for distinguished service contributing to national security and world peace through his efforts in behalf of airpower." Wilson has "labored unceasingly to educate America to the implications of the Air Age," AFA said.

Flight Award: to Maj. Charles E. Yeager, USAF. The "first man to penetrate the sonic barrier, his continued skillful piloting of research aircraft has opened new vistas of speed and altitude to meet the military requirement."

Science Award: to Lt. Col. John P. Stapp, USAF, aero-medical researcher. "His research into the problems of high-speed flight, conducted at grave personal risk, has done much to enhance the ability of USAF to perform its mission."

Arts and Letters Award: to Charles J. V. Murphy. "Through his articles in *Fortune* Magazine, thousands of influential readers have become aware of the complexity of the airpower requirement."

Earl T. Ricks Memorial Trophy: to 1st Lt. Charles J. Young, ANGUS, who won the first annual Earl T. Ricks Memorial Trophy race for ANG jet pilots. He flew 1935 miles California-Michigan in 3 hrs. 27 min. 13 sec., "thereby calling attention to the skill and proficiency of ANG jet pilots."

Piaggio To Be Produced In U. S. as Royal Gull

The Italian Piaggio L-136L twin engine, five-place amphibian will be produced and distributed in the U. S. by the Royal Aircraft Corporation, newly formed, wholly owned subsidiary of Kearney & Trecker of Milwaukee. Under terms of the agreement, Piaggio & Co. will ship the airframe and wings. Final assembly will be done by Royal, including installation of engines, propellers, instruments and radio, wheel assemblies, and all other components. The new company reportedly has purchased 50 of the airframes initially.

Called the Royal Gull, the U. S. version will utilize the 260 hp Lycoming engines which replaced the 215 hp Franklins in the Italian version. Hartzell three-bladed full feathering props complete the power plant units. Performance data is as follows: speed @ sea level, 180 mph; cruising range, 7 hrs.; service ceiling, 18,000 ft.; one-engine ceiling, 5000 ft.; climb, 3000 ft. in 3 min.; water take-off, 18 sec. Dimensions include: overall length, 35 ft. 6 in.; wing span, 44 ft. 5 in.; height, 11 ft. 6 in.; wing area, 268 sq. ft.; empty weight, 3900 lbs.; maximum useful load, 1940 lbs.; gross weight, 5840 lbs. Hull has six watertight compartments. Price is scheduled to be between \$65,000 and \$70,000.

Piaggio recently resumed production of the amphibian. The Italian Air Force had bought 18 of the 24 originally built, beginning in 1948, for air-sea rescue training.

AFA Calls for Improved Air Transport

Procurement of modern transport facilities by the Air Force has been urged by the Air Force Association during its eighth annual convention being held in Omaha, Neb. The AFA also called for restoration of the air transport wings that were dropped when the 143-wing Air Force was reduced to 137 wings.

The association declared that it is "difficult to reconcile the fact that the AF, which can deliver firepower at 600 or more miles per hour, is geared, for the most part, to a surface supply system that moves at approximately 3½ mph."

A policy statement by the AFA called for clarification of the policy of "massive retaliation" and urged that nuclear weapons be defined as "legitimate and conventional instruments."

Other moves urged by the AFA included a pay increase for military personnel, adequate housing for all service families, ROTC flight training, and

appointment of qualified airmen to the new USAF air academy.

The USAF's reenlistment rate was described to the delegates as "shockingly low" by the commander of the 3500th Recruiting Wing, Brig. Gen. Arno Luehman.

NAA Names Directors

National Aeronautics Association elected new directors at its recently concluded annual meeting in Omaha. Included are Fred Crawford, board chairman of Thompson Products, Inc.; George Gardner, president of Northeast Airlines; Robert Ramspeck, vice president of Eastern Air Lines; Jacqueline Cochran, prominent aviatrix; Casey Jones, president of Academy of Aeronautics; Roger Fleming, public relations director of GM's Allison Division; J. T. Geuting, Jr., of AIA's Utility Airplane Council; Paul Vance of Monsanto Chemical; Bruce Gimbel, president of Gimbel Bros., N.Y.; Rudy Mueller of Scientific Electronics, Omaha; and Zack Mosley and Milton Caniff, cartoonists.

New officers will be decided on at an October meeting of the board of directors.

Smathers To Study Air Problems in So. America

A business survey of South America, highlighting aviation problems, will be conducted by Sen. George A. Smathers (D-Fla.). Smathers, having been named for the job by the Senate Commerce Committee, will leave the middle of next month for a three-week tour, during which he will gather information on airport facilities, airline operations' and similar matters. He is a member of the Commerce Committee's aviation subcommittee.

Crash Ends Braniff's 14-Year Safety Record

Braniff Airways' 14-year record of operation without passenger fatality ended on August 22 with the crash of a Douglas DC-3 during a storm near Mason City, Ia., killing 11 of 19 persons aboard. Heavy thunderstorms, strong gusty winds, rain, and hail were reported in the vicinity at the time of the crash.

Before last week's accident, BNF had operated since 1939 without a passenger fatality and had registered the fourth longest record of safe operation as of December 31, 1953, according to recent awards by the National Safety Council. During the 14 years Braniff flew more than three billion passenger miles without fatality.

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